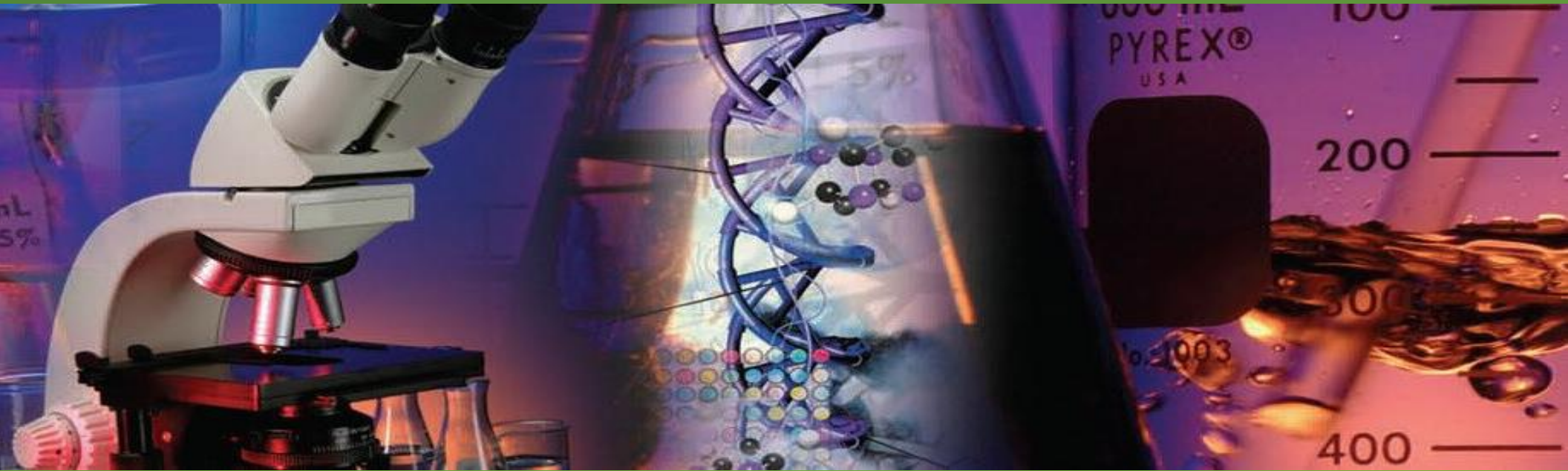


S500-2021: Why Dry? Part 1.

Almost Always Bacteria & Mold Before Drying.



NAERMC

State of Florida Approved Training

- Training provided by the National Association of Environmentally Responsible Mold Contractors (NAERMC).
- Meets training requirement for Mold and **Water** Damage for both Mold Assessor and Mold Remediator initial license as well as Continuing Education requirements.



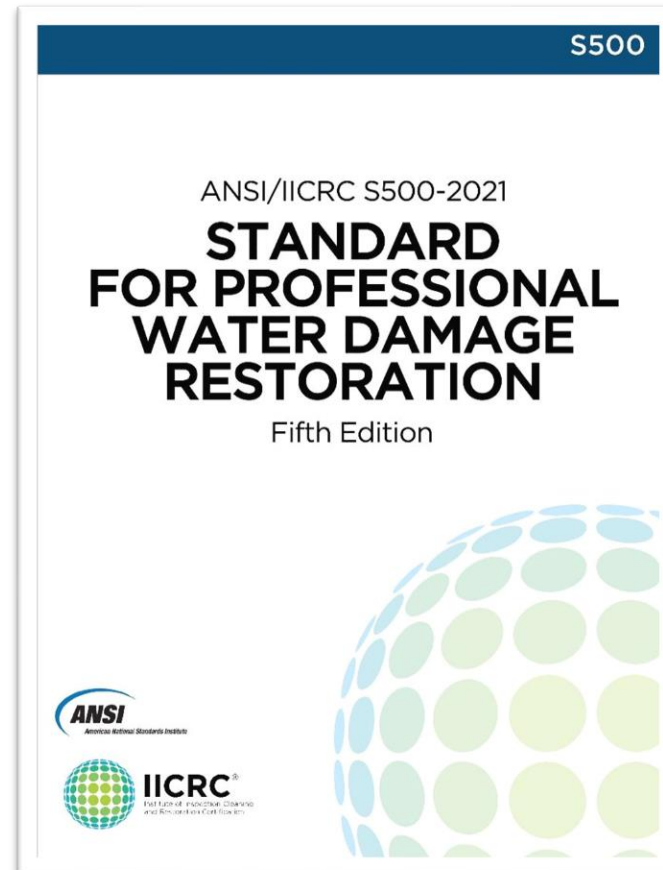
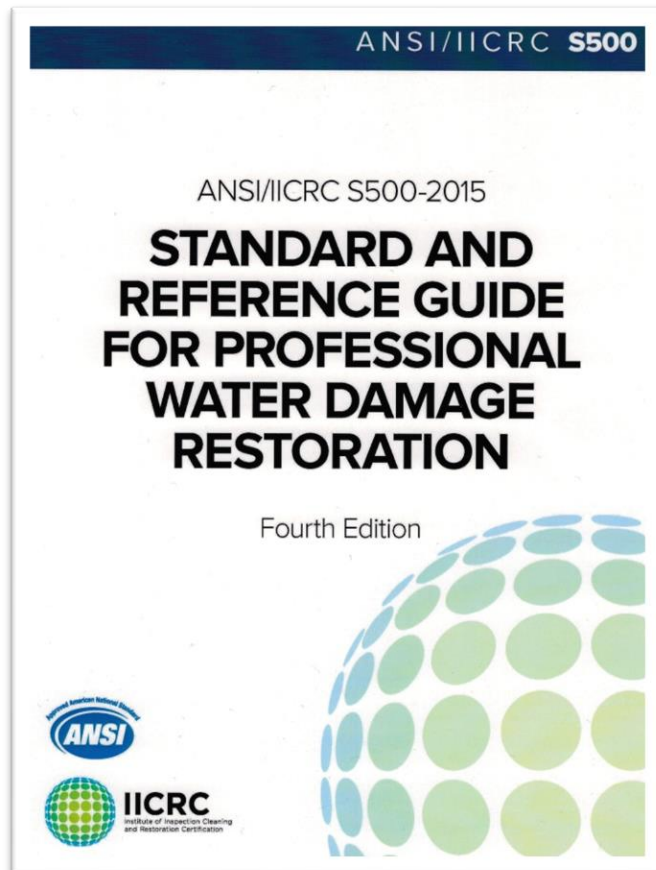
We are remediation contractors and are skeptical of drying procedures.

After a water event, we rip it out and rebuild with new. Then you know it is perfect — good "as new" — because it is new.

When it is all new you can always provide a 100% Mold-Free Warranty as well as a Green Chemical-Free Guarantee. No biocides used!



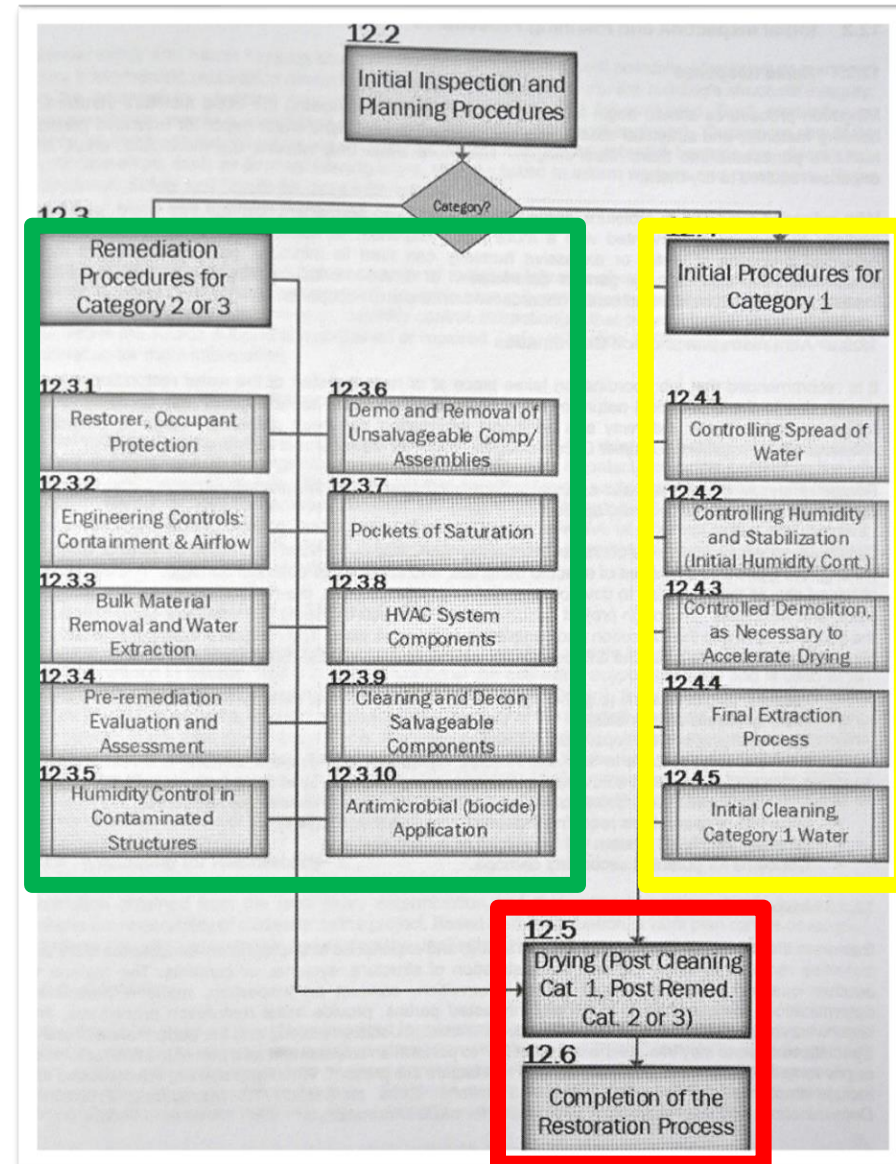
DEFINITIONS



Most Definitions are the same or similar in both S500-2015 and S500-2021. One big change as we will see is how they define the steps involved in Mitigation. Note that for the 5th Edition the Reference Guide is not included with the Standard.

IICRC S500-2021 Procedures

- Remediation. (Category 2/3). 12.3 to 12.3.10. **Green Box**
- Mitigation of clean (Category 1) water damage. 12.4 to 12.4.5. **Yellow box.**
- Restorative Drying follows either Remediation or Mitigation. 12.5 to 12.6. **Red Box**

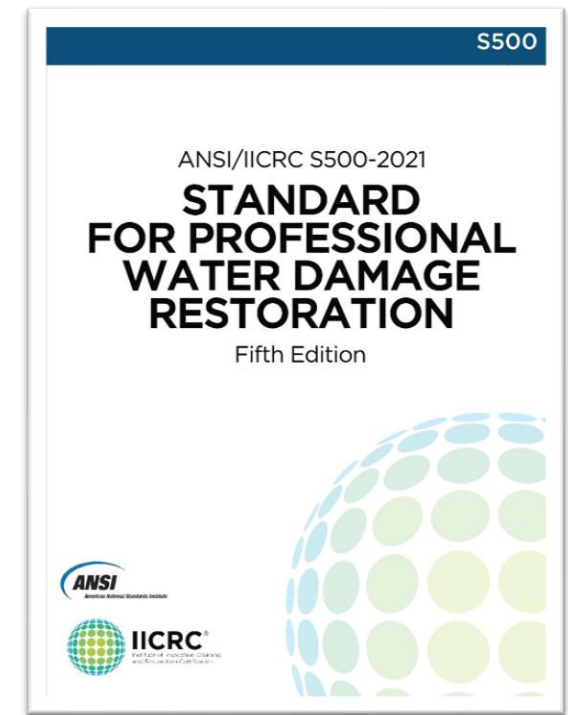


Note: With IICRC S500-2021 you must now Mitigate (yellow box) before Restorative Drying (red box).

This is a major new emphasis from earlier S500 Editions.

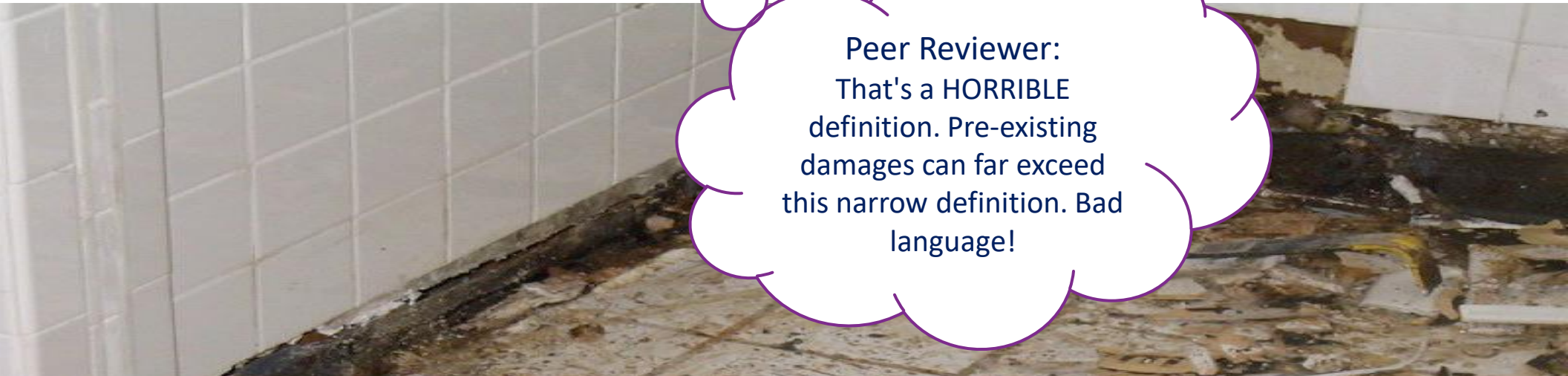
IICRC Definitions: Restoration

- Water Damage Restoration may be by either:
 - Restorative Drying or by, or in combination with ...
 - Remediation (Remove and Discard water damaged or contaminated materials including both new damage and/or pre-existing damage.
- Or by a combination of the two.



IICRC S500-2021 Definition: Pre-Existing Damage

- Pre-Existing Damage: “Is the wetting or impairment of the appearance or function of the material from direct or indirect exposure to water or other conditions not related to the current water intrusion. Examples of pre-existing damage can include, but are not limited to: dry rot, chronic water leaks, urine contamination, and visible mold growth. Indications of pre-existing damage can include, but are not limited to:”
 - “Malodors”
 - “Visible evidence of staining and deterioration;”
 - “Evidence of damage unrelated to water (e.g. wear, use, lack of maintenance.”



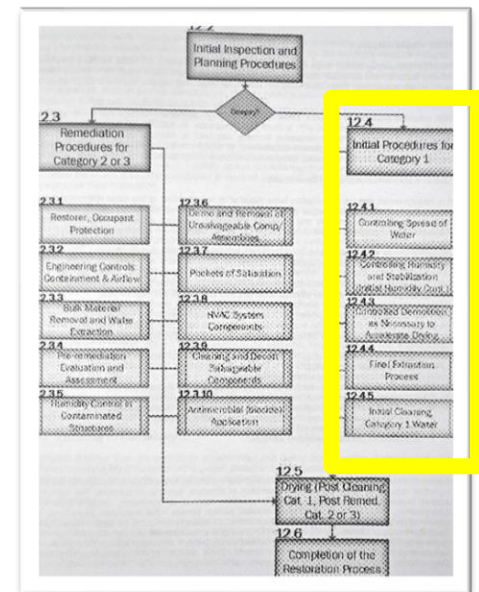
Peer Reviewer:
That's a HORRIBLE
definition. Pre-existing
damages can far exceed
this narrow definition. Bad
language!

IICRC S500-2021 Definition: Mitigation



mitigate, mitigation: to reduce or minimize further damage to structure, contents and systems in the built environment by controlling the spread of contamination and moisture.

- This step (yellow box in Flow Chart) is required by S500-2021 before starting Restorative Drying.
- In S500-2021, the Mitigation procedures are:
 - Controlling the spread of water bulk water extraction. (12.4.1)
 - **Controlling humidity. (12.4.2) *BIG CHANGE!***
 - Removal of unrestorable components (12.4.3)
 - Final extraction. (12.4.4)
 - Cleaning. (12.4.5)



IICRC S500-2021 Mitigation Controlling Humidity

- **Mitigation: Controlling humidity. (12.4.2)**

12.4.2 Controlling Humidity and Stabilization (Initial Humidity Control)

.... When using mechanical dehumidification equipment, restorers should establish an initial dehumidification capacity to establish humidity control for the anticipated evaporation load. The required capacity may be modified at any point after setup based on psychrometric readings. The restorer should document factors considered to determine the initial dehumidification capacity. Considerations may include but are not limited to:

- types of building materials, assembly and build-out characteristics;
- class and size of the affected area;
- prevailing weather conditions;
- power available on the project; and
- the presence of rapid airflow (e.g. the installation of airmovers)
- type and size of drying equipment available.

- Adding airmovers to Mitigation/ Stabilization is new and a major change to S500-2021.
- How is this Mitigation procedure any different from Restorative Drying?
 - ✓ Controlling humidity with dehumidifiers also includes;
 - ✓ Installation of airmovers.

IICRC S500-2021 Mitigation Controlling Humidity

- **Mitigation: Controlling humidity. (12.4.2)**

12.4.2 Controlling Humidity and Stabilization (Initial Humidity Control)

.... When using mechanical dehumidification equipment, restorers should establish an initial dehumidification capacity to establish humidity control for the anticipated evaporation load. The required capacity may be modified at any point after setup based on psychrometric readings. The restorer should document factors considered to determine the initial dehumidification capacity. Considerations may include but are not limited to:

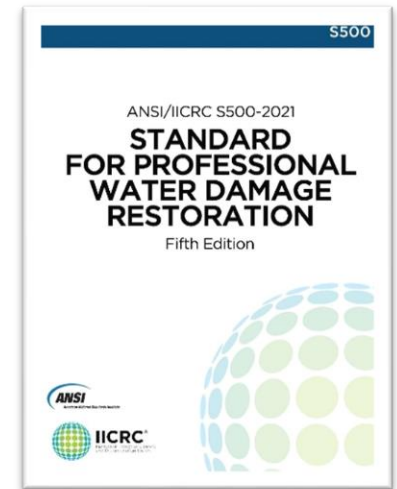
- types of building materials, assembly and build-out characteristics;
- class and size of the affected area;
- prevailing weather conditions;
- power available on the project; and
- the presence of rapid airflow (e.g. the installation of airmovers)
- type and size of drying equipment available.

Two examples of calculation methods to determine initial dehumidification capacity can be found in the appendix. After the initial installation, appropriate adjustments (e.g., increase, decrease, reposition) in dehumidification equipment capacity should be made based on psychrometric readings.

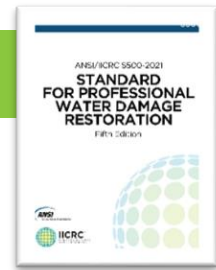
- How is this Mitigation/Stabilization procedure any different from Restorative Drying?
 - ✓ Determine Class and size of affected Areas.
 - ✓ Determine type and size of drying equipment.
 - ✓ They say to see S500-2021 Appendix to determine Initial Dehumidification capacity.

IICRC S500-2021 Definition: Mitigation Controlling Humidity

- **IICRC S500-2021 Appendix B:**
 - They say to see S500-2021 Appendix to determine Initial Dehumidification capacity to control humidity for Mitigation.
 - But these are the same Examples as for Restorative Drying which is not to Stabilize but to Restore.
 - Makes no sense. This has not been well thought out.
 - Keep in mind ... S500-2021 states: “The Appendix is informative and not part of the ANSI Standard” which to this author means you are on your own.



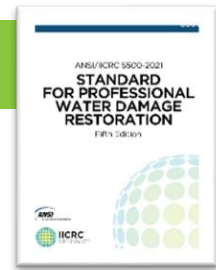
Mitigation/Stabilization vs. Restore



- Another word for Mitigation is Stabilization. The term “Stabilization” is used in S500-2021 but not defined.
- In contrast to “Restore”.

restore/restoration: to return a damaged structure, system, or contents to a normal, former or pre-damage state.

restorer: the restoration firm, contractor, or authorized representative who is responsible for the restoration of damaged structures, systems and/or contents.



Water Damage Restore/Restoration:

“To return a damaged structure, systems, or contents to a normal, former, or pre-damage state.”

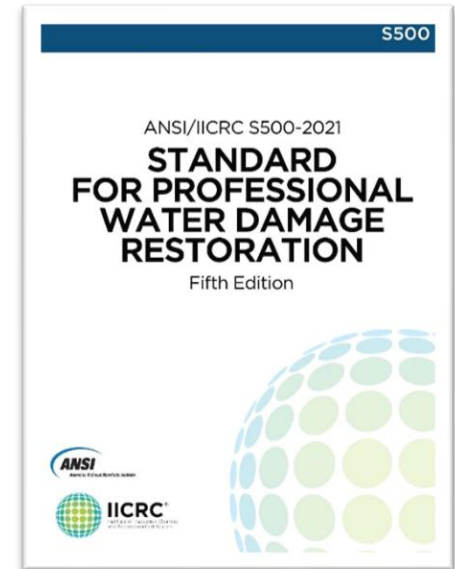


IICRC S500-2021, extensively uses but does not define what a “pre-damage” state is.

Restore as defined in S500 makes no claim to restore to “as new” or “pre-loss”. Only to a not defined “pre-damage” state. The terms “as new” and “pre-loss” are not used in S500-2021.

IICRC Definition: Restorative Drying

- **Restorative Drying:** “The controlled removal of excess moisture from an indoor environment and affected materials; thereby bringing the structure, systems, contents and materials to a pre-determined drying goal”.
- IICRC S500-2021 Restorative Drying procedures include/consist of:
 - Controlling humidity/ dehumidification. (12.5.1/2)
 - Drying using air flow. (12.5.3)
 - Controlling temperature (12.5.4/5)
 - Ongoing inspections and verifying drying goals. (12.5.6/7)
 - Post restorative drying Evaluation (12.6.1)



The Goal of Restorative Drying Per IICRC

Drying goals may be at, or above the dry standard and should be documented as they relate to specific materials. The restorer should establish drying goals that would be expected to:

- inhibit microbial growth; and
- return materials to an acceptable moisture content or level.

- The goal of Restorative Drying is to dry to an acceptable level of dry, at a rate and using procedures that do not result in microbial growth (mold/ bacteria.)



IICRC Recommended Use of Biocides

12.3.9 Cleaning and Decontaminating Salvageable Components

Decontamination should be accomplished to the extent possible by cleaning. Restorers should employ cleaning methods that minimize aerosolizing contaminants while maximizing complete removal. However, low pressure washing to flush contaminants from salvageable components may be appropriate. Wastewater from cleaning processes should be collected and properly disposed. **It is recommended that when decontamination cannot be practically completed by cleaning alone, that appropriate antimicrobial (biocide) or mechanical means be employed.** Refer to the current version of the *ANSI/IICRC S520 Standard for Professional Mold Remediation*.

- **IICRC S500-2021 recommends the use of biocides. WE DO NOT!**

It is not possible to restore materials to a pre-damage state if they have been sprayed with biocides as there was no (toxic) biocide residue on the pre-damaged materials.

The use of biocides is contrary to the IICRC definition of Restoration (return to pre-damage state). Nevertheless, heavily used by Restoration Contractors. Paid by Carriers per sq ft. The more you spray the more \$\$ you make.

Peer Reviewer:
Antimicrobials are absolutely a component of decontamination. Washing is always a part of proper decontamination in conjunction with the legal use of antimicrobials.

12.3.10.3 Biocide Use, Safety and Liability Considerations

Antimicrobials (biocides) can harm humans, pets and wildlife if used improperly. When using antimicrobials (biocides) in water damage restoration activities for efficacy, safety, and legal liability reasons, restorers shall follow label directions carefully and explicitly. **In some countries, such as the United States, it is a violation of law to use these products in a manner inconsistent with the label.** In order to minimize potential liability, restorers shall comply with applicable training, safety, use, and licensing requirements in their respective jurisdictions, and apply and dispose of products/container strictly in accordance with label directions.

- IICRC S500-2021 recommends the use of biocides. WE DO NOT!
- We recommend Green, Chemical-Free procedures only.
- Important: ALL popular commercial disinfectants used by restoration contractors are EPA restricted use for: “Hard surfaces only.”
- Use contrary to label directions is against Federal Law.
- See next page label from BotanicaClean. Note that MicroBan, Mediclean, Fiberlock all have the same restriction.

Example BotaniClean Label. Restricted Use.

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.

DIRECTIONS FOR USE: It is a violation of Federal Law to use the product in a manner inconsistent with its labeling.

CLEANING AND DISINFECTING DIRECTIONS: Gross filth and heavy soil must be removed before applying cleaning solution. Apply to 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.**

BotaniClean is an excellent one-step cleaner disinfectant for working surfaces, including stainless steel, chrome, glass and vinyl. Use BotaniClean for all disinfection of hard, non-porous surfaces (floors, walls, tables, etc.) in Healthcare Facilities including Operating Rooms, Intensive Care, Nurseries, Emergency Areas, Dental Operatories, Dental and Medical Offices, Oral Healthcare Facilities, Oral Surgery Centers, Dental Schools, Schools, Hospitals, Nursing Homes, Prisons, Dental Labs, by Police and EMS, **Residential, Restoration, decontamination and remediation sites (fire, water, sewage, trauma scene decontamination and remediation)** as well as other areas/facilities concerned with the hazards of cross contamination. Use for one-step cleaning, disinfecting and deodorizing of devices and surfaces potentially contaminated with microorganisms and other items made of stainless steel, chrome, glass, non-porous vinyl, glazed porcelain, metal, plastics, Plexiglas®, glazed tile, washable painted or varnished surfaces, linoleum, and rubber.

When used as directed, BotaniClean effectively cleans and disinfects hard, non-porous environmental surfaces such as: ambulance patient care surfaces, anesthesia equipment surfaces, baby/infant care surfaces, backboards, bathing units, bathrooms, bed railings, blood pressure devices, cabinets, chairs, changing tables, computer surfaces, countertops, CT equipment/surfaces, curing lights, dental equipment surfaces/devices, doorknobs, floors, garbage cans, highchairs, infant care equipment, keyboards, laboratory equipment/

IICRC Requires: Written Informed Consent

12.3.10.3 Biocide Use, Safety and Liability Considerations

Restorers should:

- Discuss potential risks and benefits with the customer, make available product information including the label and the SDS, and obtain a written informed consent with the customer's signature before applying any antimicrobial (biocide).

- IICRC S500-2021 requires “written informed consent with customer’s signature” before applying a biocide.
- This is NOT a line on your contract saying “Signee hereby agrees to allow the use of Anti-Microbials”.



Written Informed Consent



informed consent

phrase of consent

permission granted in the knowledge of the possible consequences, typically that which is given by a patient to a doctor for treatment with full knowledge of the possible risks and benefits.

"written informed consent was obtained from each patient"

Definitions from Oxford Languages

Feedback

- Full knowledge mean that if/when the restorer uses it on drywall (porous) the restorer explains that this is illegal usage.



IICRC Definitions Restore/Restoration Continued

- Restoration to a “pre-damage” state is (per IICRC S500-2021) usually performed by a combination of:
 - Restorative Drying if the material is “Restorable” and/or
 - Wet or Dry Material Removal (Contaminated/Not Restorable) if the material is not restorable ... cannot be dried to “pre-damage” condition because there is pre-existing damage, and/or
 - Wet Material Removal (Not Contaminated/Restorable) because wet material removal is faster/cheaper than drying.
- Note: IICRC S500-2021 is not called the Drying Standard. It is called the Restoration Standard because oftentimes (actually usually) a property cannot be restored by drying alone. Must be restored by material removal/Remediation followed by drying.



IICRC S500-2015 Definition: Unrestorable.

- Unrestorable “a determination made when materials in a structure, systems or contents exhibit quick developing impacts of moisture sorption (e.g. significant structural damage, unacceptable flaws, or cosmetic effects;”
 - “An inability to be adequately cleaned or sanitized;”
 - “Prohibitive cost of restoration; or”
 - “An inability to ensure achievement of drying goals throughout the material or assembly.”

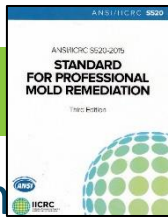


IICRC S500-2015 Definition: Unrestorable.

- IICRC S500-2021 definition restricting *unrestorable* to only “quick developing” makes no sense and contradicts usage in S500-2021. For examples:
 - 12.2.9 “Discoloration of finish, or splitting of wood components.” Unrestorable. But not necessarily quick.
 - 14.5.2 “Metal items can be unrestorable due to corrosion.” Unrestorable. Never quick.
 - 16.2.2 “Cat 2/3 Gypsum board structural damage/sag.” Unrestorable. Not quick.
 - Although the terms “wood rot” or “wood damage” do not appear in S500-2021, of course wood rot/damage is: Unrestorable. Not quick.



IICRC Definition: Remediation



- Remediation “The process of removing microbial contamination consistent with IICRC Standards.”
- S500-2021 procedures for Category 2 or 3 Water damage include the following:
 - Restorer, Occupant Protections (12.3.1)
 - Engineering Controls (12.3.2)
 - Bulk Material Removal / Water Extraction (12.3.3)
 - Pre-remediation Evaluation & Assessment (12.3.4)
 - Humidity Control (12.3.5)
 - Demolition and Removal of Unsalvageable Components and Assemblies (12.3.6)
 - Open Assemblies and Remove Unrestorable Pockets of Saturation (12.3.7)
 - Check/Clean/Dry AC and AC components (12.3.8)
 - Clean and Decontaminate Salvageable Components (12.3.9)
 - Apply anti-microbial (12.3.10). [NAERMC is green chemical free. This step is not recommended.]

Remediation Is Also ...

- For IICRC, Remediation focus is on removal of contaminated (Cat 2/3) porous material, and only in extreme conditions semi-porous substrates such as solid wood.
- [See discussion in Module 7 regarding “pressed wood”.]
- But Remediation/Removal is also:
 - **Air cleaning:** Air scrubbing/ air washing.
 - **Hard surface cleaning.** Swiffer, soap water, Lysol etc.
 - **Oxidation of Microbial Contaminants on Surfaces:** Removing microbial contaminants by disintegration with strong oxidizers such as bleach, strong hydrogen peroxide, or treatment using chlorine dioxide gas with EPA approved product /method.
 - **Oxidation of Microbial Contaminants in the Air:** Vaporized hydrogen peroxide, or chlorine dioxide gas with EPA approved product/method.

Peer Reviewer:

Other air treatment devices exist that alter contaminants or make claims to improve air quality and control odors. These devices can include ozone and hydroxyl generators, electrostatic precipitators and ultraviolet lamps. Some of this equipment can produce varying amounts of ozone, which can cause health concerns in an occupied environment. Reviewer only recommends the use of EPA approved biocides. [This course does not endorse the use of any biocides ... chemicals that leave a toxic residue.]

Terms: Water Damage vs Water Event



Peer Reviewer:
You're opening up a Pandora's Box. If there's no damage... there's no insurance claim. The policy only covers "damage" ... not "events." You're new language can get claims denied. [GR. I don't think so. GR is a FLA Licensed Insurance Adjuster]

- IICRC S500-2021 is the Professional **Water Damage** Restoration Standard.
- IICRC uses the term “water damage” but nowhere does IICRC define the term “water damage”.
- If there is no pre-existing damage and the water is dried promptly and correctly (per IICRC S500) and the materials are fully restored ... there is no resultant damage.
- Water Damage, is then perhaps poor choice of words. But this is common usage.
- We prefer the term Water Event.

Terms: Water Loss vs. Water Event

- Similarly, IICRC calls Water Damage ... Water Losses.
- IICRC uses the term “water loss” but nowhere does IICRC define the term “water loss” which is an insurance term.
- If there is no pre-existing damage and the water is dried promptly and correctly (per IICRC S500-2021) the materials are restored to pre-loss condition. There is no loss.
- Again, poor choice of words. But this is common usage.
- We prefer the term Water Event.





IN-PLACE DRYING (IPD) RESULTS IN MOLD



IICRC Definitions Mitigation/Stabilization AKA In-Place Drying



- With the new definition of Mitigation in IICRC S500-2021 that includes the use of airmovers, IICRC is bringing back the discredited procedure called In-Place Drying.
- IICRC defined In-Place Drying (Surface only drying) in their 2004 *“Technical Advisory on “In-Place Drying”** as:
 - A “method of drying components, without significant removal of furnishings or fixtures”.

Peer Reviewer:
IICRC has ABANDONED the subject of "in-place drying." It is a dangerous and obsolete method of restorative drying. It has not been in our standards since 2006. 2015 does not speak of it. Neither does 2021 [GR. Now they have brought it back and call Mitigation/Stabilization].

<https://www.scrt.org/scrt-free-reports/42-technical-advisory-on-in-place-drying/file>

In-Place Drying Definition Continued

- **In-Place Drying** (Surface only drying) is performed by blowing air on surfaces without removal of furnishings, trim, structural components, or fixtures.

Examples:

- Carpet & pad dried in-place (floated). Not detached or removed.
- Walls dried without first removing baseboards.
- Cabinets dried without first removing toe kicks.
- Kitchens dried without first removing dishwasher to check for mold.



Peer Reviewer:
This slide has NOTHING to
do with the new S500.
[GR. Now they call it
Mitigation].

In-Place Drying Definition Continued

- **In-Place Drying (Surface only drying)** is performed without checking assembly interiors for microbial growth before drying. Examples:
 - Cabinets or wall cavities with pre-existing microbial contamination “dried” by blowing air on them.



Peer Reviewer:
This slide has NOTHING to
do with the new S500.
[GR. Now they call it
Mitigation].

In-Place Drying Definition Continued

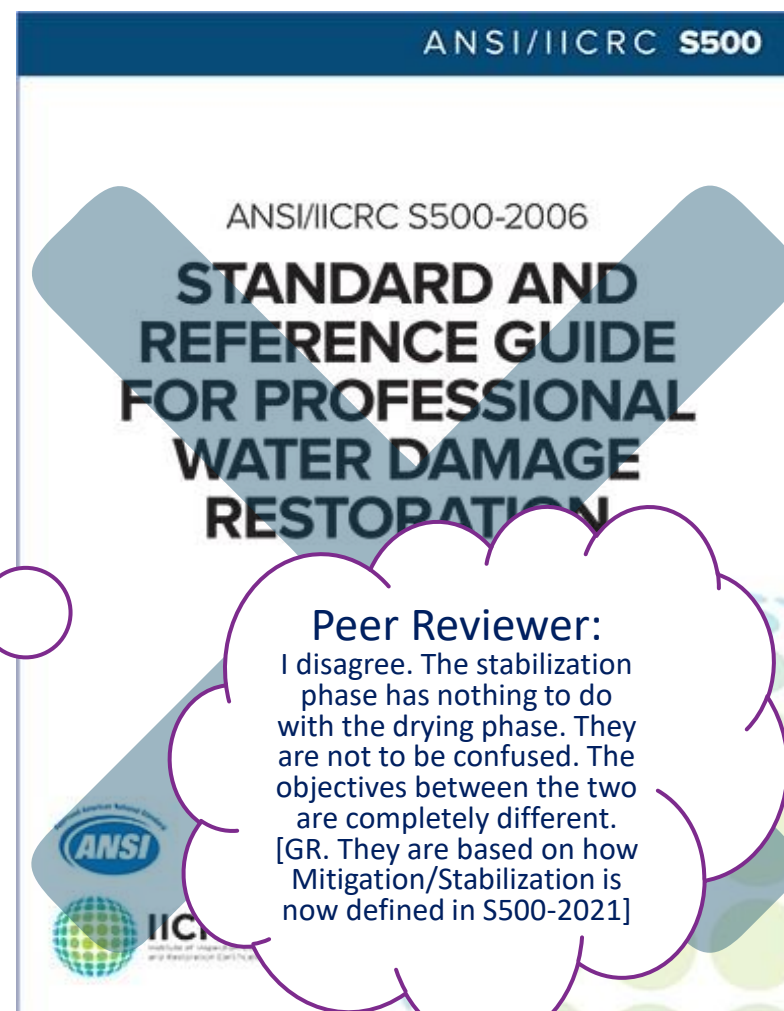
- With In-Place Drying, there is almost always mold/bacteria growth upon completion of drying/Mitigation/ Stabilization either because it was pre-existing or due to slow and/or improper surface only drying.
- **In-Place Drying (Surface only drying)** is performed without checking assembly interiors for microbial growth after drying.



Peer Reviewer:
This slide has NOTHING to
do with the new S500.
[GR. Now they call it
Mitigation].

In-Place Drying (IPD) Results in MOLD

- In-Place Drying (IPD - Surface only drying) is a drying method proposed/introduced in the earlier IICRC S500-2006 **3rd edition** as a restoration procedure.
- As a restoration procedure, IPD (Surface only drying) has been discredited and is not a substitute for IICRC compliant Restorative Drying.
- IPD (Surface only drying) had been removed from the S500-2015 4th Edition).



Now S500-2021 has brought back IPD by now including airmovers as part of Mitigation.

In-Place Drying Based on WRONG Assumptions

1. The leak is a sudden event. Often or usually wrong.
2. Category 1 water source REMAINS Category 1 even as it flows within the structure and assemblies. Almost always wrong.
3. Since a recent/sudden event ... most of the moisture is surface moisture and not deeply bound and can be easily and quickly removed by blowing air on surfaces. Often wrong.
4. Mold and bacteria grow slowly. Wrong.
5. Somehow wet areas will completely dry inside of walls, even behind low permeance (hard to dry) baseboards, low permeance (hard to dry) cabinets, etc. in 3-4 days of blowing air on surfaces and there will be no mold/microbial growth after drying/ Mitigation/Stabilization . **Always Wrong.**



Peer Reviewer:
The most important
"wrong assumption:"
Category 1 water
source REMAINS
Category 1 even as it
flows within the
structure and
assemblies. I have
found one in 100
losses are actually
Category 1. [Agreed]

IICRC Has Recognized That IPD Assumptions Are WRONG

- The reality is that most water events are from longer term slow leaks rather than sudden events.
- Yes, there might have been a burst pipe at the defined Date of Loss, but in almost all cases it started as a slow / hidden leak over many months or years before the pipe ruptured.
- So there is almost always pre-existing mold/bacterial growth with IPD.

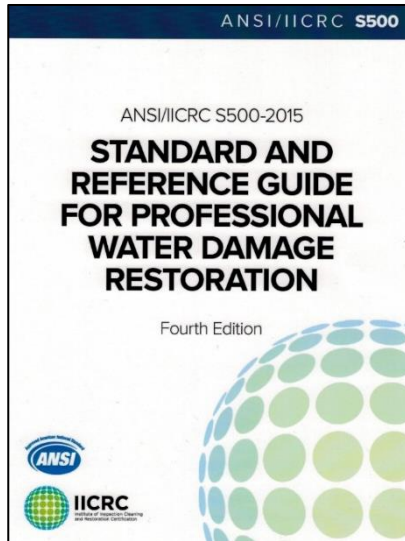


IICRC Has Recognized That IPD Assumptions Are WRONG

- Due to the typically length of time of the hidden water exposure there is always or almost always mold, and irreversible damage, and hard to dry, deeply bound water (not surface moisture) behind low permeance (hard to dry) surfaces before drying starts.
- In the real world (not artificial dry houses) few properties could be reliably restored in 3-4 days (before mold starts growing) by In-Place Drying (blowing air on surfaces) because usually there is already mold growth from the hidden leak.



IPD: Eliminated From IICRC S500-2015



As a result of IICRC member findings, In-Place Drying (IPD) that was introduced/featured in S500-2006 3rd Edition was eliminated from the next release ANSI-Approved IICRC S500-2015 [4th Edition]

Peer Reviewer:
I disagree. I believe
you have come to a
faulty conclusion on
what Stabilization
"is."

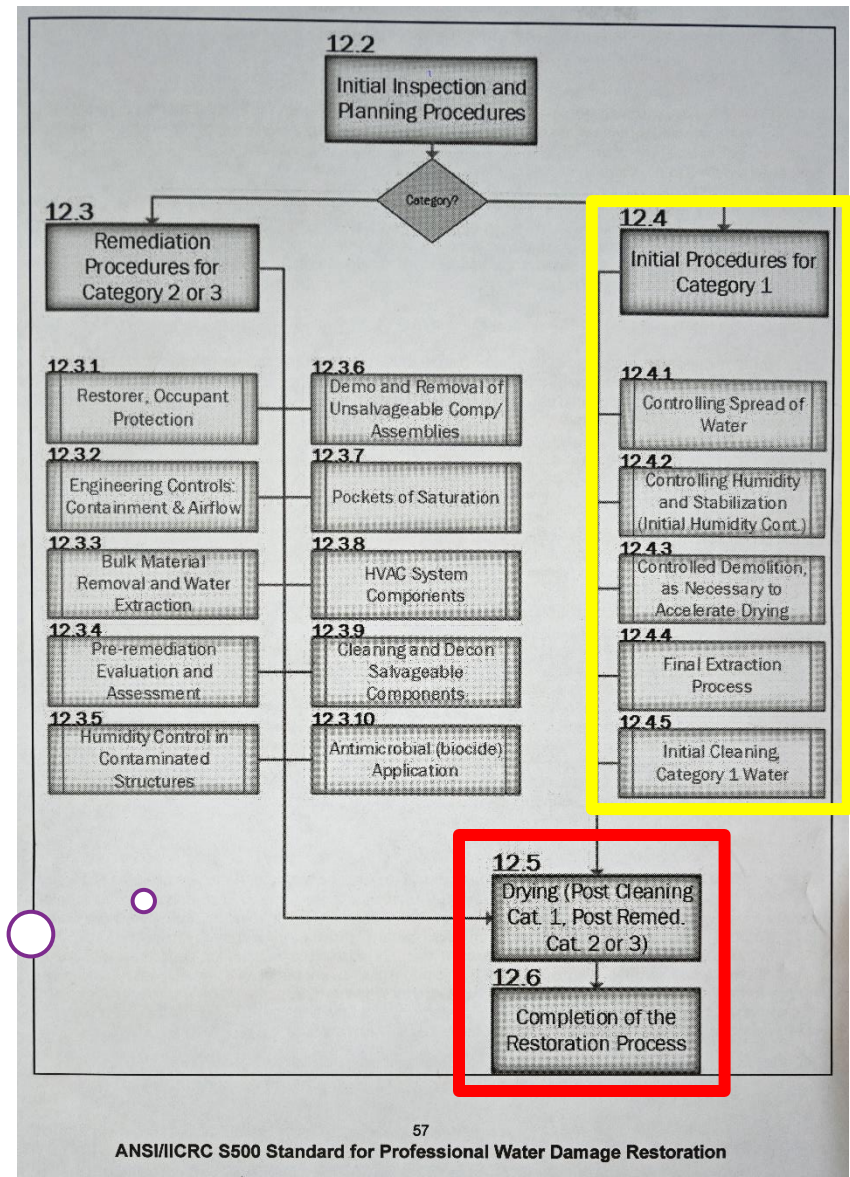


But now returns in S500-2021 under the guise of a newly defined "Mitigation" that includes the use of airmovers.

- Mitigation of clean (Category 1) water damage. Yellow box.
- Restorative Drying. Red Box.

IICRC S500-2021 DOES NOT INCLUDE A POST MITIGATION INSPECTION AFTER MITIGATION (12.4.5) OR A PRE-DRYING INSPECTION BEFORE RESTORATIVE DRYING (12.5).

Peer Reviewer:
Yes it does!
Read 12.3.4 and 12.3.10.4
[GR. Those are in
"Remediation"]



12.4.5 Initial Cleaning, Category 1 Water

After controlled demolition and extraction of water have been completed, but prior to implementing the restorative drying effort (e.g., rapid air movement), restorers should clean materials and surfaces (e.g., carpet, hard surface floors, exposed subfloors) to reduce the amount of soil or particulates that can become aerosolized. Restorers should employ cleaning methods that minimize aerosolizing particulates.

The drying process inherently tends to aerosolize soil and particulate present in the environment. As water evaporates from surfaces and materials such as carpet, more particles often become aerosolized, creating possible health, safety, comfort and cleanliness issues. Where cleaning cannot sufficiently remove soil or particulates, or there are high-risk occupants, restorers can install one or more air filtration devices (AFDs).

12.5 Drying (Post Cleaning Category 1, Post Remediation Category 2 and 3)

After completing the initial procedures for category 1, or decontamination process for category 2 and 3, Restorers should implement the drying plan to control airflow (i.e., volume, velocity), humidity (i.e., dehumidification, ventilation) and temperature (i.e., vapor pressure differential) to work towards the drying goals. These conditions should be managed throughout the drying process.

**NO
INSPECTION
HERE.**

After Mitigating damages [12.4 to 12.4.5] there is: **No Post Mitigation Inspection.**

Just start Restorative Drying.

Just assume that all is good. No mold. No bacteria. Even though bacteria grow in 8 hours. Mold starts to grow in 48 hours.

Peer Reviewer Comments on Previous Page:

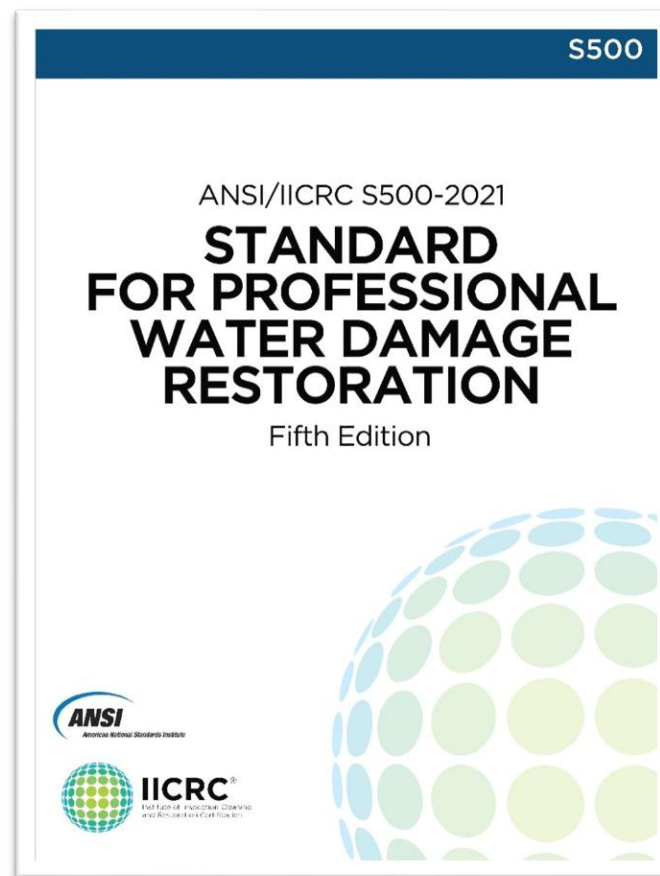
This is a sweeping and inaccurate statement that neither the standards nor authoritative sources substantiate. Many bacteria can replicate in as short a time as 15 minutes.

Mold germination can vary from a few hours to several weeks. Furthermore, it is possible for water to be present in a structure for WEEKS and have minimal or 'no' amplification. Think of your refrigerator. Cold temperatures dramatically control microbial activity. In fact, microorganisms are much more affected by temperature than they are by time. The ladder is leaning against the wrong wall (time). It's about temperature much more than time. [GR. It's both time and temperature. Both airmovers and dehumidifiers generate heat and increase the temperature. Certainly the increase in temperature from drying equipment accelerates microbial growth.]

IICRC S500-2021

Restoring Assemblies

Last But Not Least



DEFINITION: ASSEMBLY/ASSEMBLIES

The last Section in S500-2021 is on Inspecting and Restoring Assemblies

- S500-2021 does not define an assembly.
- But in the Appendix they provide examples of Assemblies.
 - Engineered wood.
 - Pressed wood.
 - Drywall or Plaster walls or ceilings.
 - Insulated walls or ceilings.
 - Tiled walls.
 - Wall papered walls.
 - Carpet/pad

Everything in a home is an assembly. Yet IICRC S500-2021 puts treatment of assemblies in Section 16, the last section of the Manual.

REMEDiate FIRST. THEN DRY.

16.1 Evaluating the Restorability of Building Materials and Assemblies

Restorers should consider several criteria when determining that materials or parts of an assembly are restorable. The restorer should understand the affected materials and construction. This can include but is not limited to the presence of interstitial spaces, vapor barriers, integrity of the top finish-coat or other finish material. While some affected materials can be readily restored, they may require removal in order to access other components. Understanding the affected materials and assemblies will help the restorer determine a successful approach to drying.

Much of the information is obtained during the initial inspection. When materials are determined restorable but contamination issues exist, restorers should employ the appropriate remediation procedures prior to drying efforts defined in this section.

- **Restoring Assemblies. Last Section in S500-2021. Chapter 16.**
 - Vapor barriers, material finish, insulation all affect the drying rate.
 - Removal may be required to properly dry and or to access other components or areas.
 - When contamination exists. Remediate before drying.

REMEDiate FIRST. THEN DRY.

16.2 Materials, Assemblies and Restoration Procedures

16.2.1 Pre-restoration Evaluation of assemblies

Evaluating layers or assemblies of materials should be done when it is suspected that water has migrated under or into it. Restorers should understand the particular construction in order to determine the best restoration approach.

Properly inspecting, cleaning, drying, and restoring these assemblies can require removal of surface or multiple layers of them. If finished wall material (e.g., gypsum board, plaster) requires replacement, restorers should commence removal first; then properly dry exposed sub-surfaces and framing to the predetermined drying goal prior to reinstallation of finish materials.

- **Restoring Assemblies. Last Section in S500-2021. Chapter 16.**
 - Evaluate layers or assemblies if suspected that water has migrated under or into it. **This is 100% of the time.** There is never a water event that can be dried using In-Place Drying.
 - Remediate before drying.

REMEDiate FIRST. THEN DRY.

16.2.2 Remove and replace unrestorable materials

Some affected materials or assemblies should not be restored due to (1) quick developing impacts of moisture sorption, (2) inability to adequately clean or sanitize, or (3) inability to ensure achievement of drying goals throughout the assembly. Materials and assemblies that should be removed and replaced include but are not limited to:

- gypsum board ceilings that are sagging due to saturation;
- gypsum board that has obvious physical damage;
- laminate flooring; and
- **many multi-layer flooring systems (e.g., laminate, vinyl sheet, parquet, engineered wood) under which water has migrated cannot generally be sufficiently dried, cleaned, or sanitized.**

- **Restoring Assemblies. Last Section in S500-2021. Chapter 16.**
 - Unrestorable materials or assemblies ...
 - Remove and replace.

REMEDiate FIRST. THEN DRY.

16.2.2.1 Remove and replace in Category 2 or 3 intrusion

Following a Category 2 or 3 water intrusion, affected materials or assemblies that **should be removed and replaced include**, but are not limited to:

- **carpet cushion (pad, underlay);**
- HVAC internally lined duct board;
- HVAC external insulation on metal duct;
- wall insulation (e.g., loose-fill, cellulose, mineral wool, fiberglass, open-cell foam);
- **particleboard or MDF;** and
- many multi-layer flooring systems (e.g., laminate, vinyl sheet, parquet, engineered wood) under which Category 2 & 3 water has migrated cannot generally be sufficiently dried, cleaned, or sanitized.

- **Restoring Assemblies. Last Section in S500-2021. Chapter 16.**
 - Cat 2/3: Unrestorable materials or assemblies ...
 - Remove and replace.
 - Carpet cushion; particleboard/MDF/
 - Note: This is the only location in the S520 that uses the term “particleboard”.

REMEDiate FIRST. THEN DRY.

16.2.2.2 Remove and replace in Category 3 intrusions

Following a Category 3 water intrusion, affected materials or assemblies that should be removed and replaced include, but are not limited to:

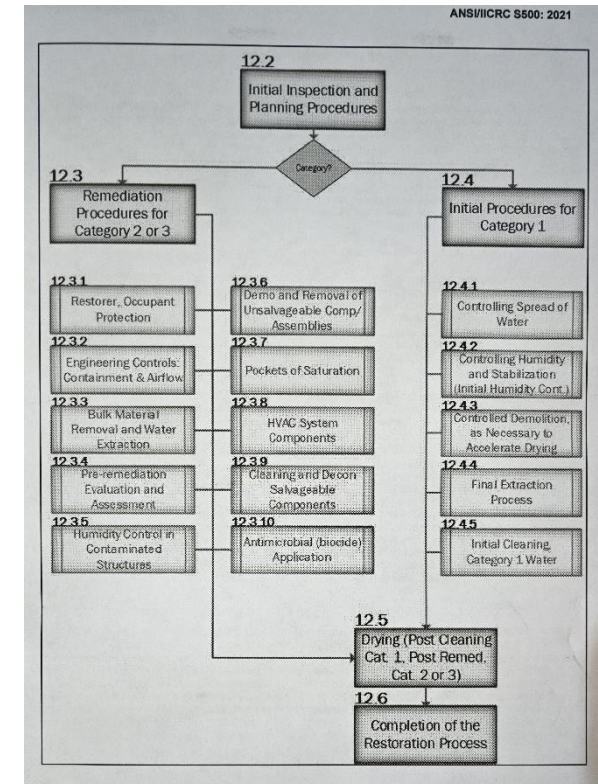
- **gypsum wallboard** (single-layer, multiple-layers, both standard and fire-rated);
- mineral fiber lay-in ceiling tiles;
- wall insulation;
- sound attenuation board;
- wallpaper (e.g., vinyl, textile);
- wood paneling; and
- **carpet and carpet cushion** (pad, underlay).

- **Restoring Assemblies. Last Section in S500-2021. Chapter 16.**
 - Cat 3: Unrestorable materials or assemblies ...
 - Remove and replace.
 - Carpet cushion; particleboard/MDF/
 - Note: This is the only location in the S520 that uses the term “particleboard”.

REMOVE MATERIALS TO INSPECT, FACILITATE DRYING, CLEANING OR RESTORATION.

16.2.3 Controlled demolition of assemblies

If it is determined that a layer or layers of material require removal in order to facilitate inspection, drying, cleaning, or restoring an assembly, it should be done as soon as practical after the decision is made. Removing exposed layer(s) of the assembly can facilitate cleaning and drying of the framing or other substructure materials.



The focus of S500-2021 is given in the IICRC flow chart. The flow chart does not include Chapter 16 which says if water flows under or into an assembly ... open. Do not dry.

When does water NOT flow under or into assemblies? Never.

SECTION CONCLUSIONS

16.2 Materials, Assemblies and Restoration Procedures

16.2.1 Pre-restoration Evaluation of assemblies

Evaluating layers or assemblies of materials should be done when it is suspected that water has migrated under or into it. Restorers should understand the particular construction in order to determine the best restoration approach.

S500-2021 has a new strong focus on Mitigation/Stabilization which is newly defined to include use of airmovers in addition to dehumidifiers.

This is essentially renamed In-Place Drying.

S500-2021 discusses the need to open assemblies if water migrated under or into it (ALWAYS) tucked in the back. Last chapter. Chapter 16.

Not included in their Flow Chart.

A decorative circular graphic composed of numerous colorful segments in shades of blue, green, yellow, orange, red, and purple, arranged in a ring around the central text.

Conclusion

Stabilization Services vs. Restoration per R&R Article

- “Stabilization services [In-Place Drying] are used during the investigation stage of the claim before coverage has been determined or before the hazard assessment is completed”.
- “Most commonly, stabilization services are used while:
 - Determining coverage issues,
 - Identifying the cause of loss,
 - Determining who is the responsible party, or
 - Waiting for testing results of hazardous materials such as lead, asbestos, and now silica.”



<https://www.randrmagonline.com/articles/88565-the-death-of-3-day-drying>

Stabilization Services vs. Restoration per R&R Article

- “Stabilization services serves only one purpose and that is to [in theory] prevent additional secondary damages that can range from high humidity, prevent cross-contamination to unaffected areas and/or to allow the restorer to secure the job site.

The article goes on to say: “If the job is left in the stabilization phase a restorer can anticipate the degrading of water in categories and there is a high potential for mold growth both on the exterior surfaces and the backside of the materials.”

Stabilization Services vs. Restoration

- In the real world, the job is almost **always** left in the IICRC S500-2021 defined Mitigation/Stabilization Phase.
- Both Carriers and Independents want to stop there. Easy money. Then call that Done.
 - Take surface moisture measurements. If the surface is dry... Done.
 - Spray biocides illegally on porous drywall, pressed wood cabinets and carpet and collect their \$\$.
- **As a result .. Always mold after what they call drying.**

Why Mold/Bacteria After Drying with IICRC S500-2021?

Why Mold/Bacteria [Cat 2/3 Damage] After Drying with IICRC S500-2021?

Because instead of going straight into Restorative Drying, Restorative Drying is delayed by Mitigation.

However, after this delay even though mold grows fast / bacteria even faster ... there is no inspection after mitigation/ before the following restorative drying.

Why always Cat 2/3 Damage after Restorative Drying? Because it was already there as a result of delays caused by S500-2021 added [Required] Mitigation step.

Peer Reviewer:
Disagree.

How Does S500-2021 Mitigation Differ from Restorative Drying?

How Does S500-2021 Mitigation Differ from Restorative Drying?

There is little to no difference in the procedures as now defined in S500-2021. The only substantial difference is that Restorative Drying requires ongoing inspections and Monitoring (12.5.6).

And Post Restorative Drying Evaluation (12.6.1)

Peer Reviewer:
Disagree.

Why Mold After Drying?

Insurance Carriers love IPD/Mitigation. And they love not testing for microbial growth afterwards.

So do many or most Dry-out Contractors.

They are always going to stop at Step 12.4.5 (after Mitigation.)

Leaving walls full of mold.



Peer Reviewer:
Disagree.

Why Mold After Drying?

IPD is now back by popular demand under the guise of S500-2021 mandated Mitigation which is newly defined to now include the use of airmovers to accompany dehumidification.

IPD/Mitigation leaves walls full of mold.

That's why Mold After Drying with IICRC S500-2021.



Peer Reviewer:
Disagree.

We are remediation contractors.

After a water event, we always rip it out and rebuild with new. Then you know it is perfect — good "as new" — because it is new.

**And you can always provide a 100% Mold-Free
Warranty as well as a Green, Chemical-Free
Guarantee.**

No biocides used!

