
REMEDIATING MOLD FROM PAINTED SURFACES

Understanding Some of the Complexities of Mold Remediation

One of the most difficult things for cleaning and restoration contractors who offer mold remediation services to grasp is that such efforts are controlled by a standard of care that requires adherence to a large number of principles while allowing much flexibility in the exact steps that are used to implement those principles. Another interesting aspect of the mold remediation field is that the principles are global in nature while the specific equipment, supplies, and chemicals used to complete the work tend to be national, or even regional, in their market penetration. This leads to a wide variation in work details, yet a strong consensus regarding the work goals and general approach.

These aspects of mold remediation, which can seem confusing and even contradictory to the untrained or inexperienced professional, were on full display in a recent consultation with a contractor in Great Britain. In this particular case the contractor looked at project that had moderate to severe mould¹ growth throughout most of the property. The photos which he provided confirmed his judgment about the severity of the contamination (see photos 1 and 2).

Photo 1:

Interior of water-damaged residence where delays in drying and restoration allowed conditions to develop throughout the house which promoted a variety of different types of fungal colonies. Photos such as these are the best motivators to encourage property owners to treat water intrusion incidents as if a fire had occurred – immediate responses are necessary to keep the damage from getting worse in the directly impacted area, as well as limiting the spread of the problem to surrounding rooms and floors.





Photo 2:

Diffuse but widespread fungal colonies on upper walls and ceilings are usually an indication of high humidity in a structure for an extended period of time. Warm air carries the water vapor upward where it contacts the surfaces and condenses into droplets. It is this “free water” that allows fungal colonies to develop. This scenario was confirmed by comments from the contractor who indicated that primary water intrusion had occurred on the lower floors of the house.

The contractor understood that the principles of mold remediation require that all porous materials with visible fungal growth must be carefully removed in order to avoid cross-contamination.² He knew that the wallpaper, carpet, insulation, and rotted wood have to go. However, the contractor had reservations about gutting all of the:

- Plaster walls and ceilings
- Square edged floorboards
- Window sills
- Fire surround³
- Skirting boards⁴
- Covings⁵
- Architraves⁶
- Doors and hatch entry

A quick review of the photos verified that the walls under the wallpaper were indeed plaster rather than drywall and that gutting a lot of the architectural finish would make it very expensive to bring the building back to pre-loss condition (see photos 3 and 4).

Photo 3:

Another indication that high humidity levels in the house had persisted for quite some time was the mold growth on the plaster walls underneath the wallpaper. Although the pH of the plaster is not conducive to mold growth, the paste residue is a great nutrient source. Notice also that the doors appear to be solid wood panel doors, even on the interior, something that has long since departed from modern American buildings.



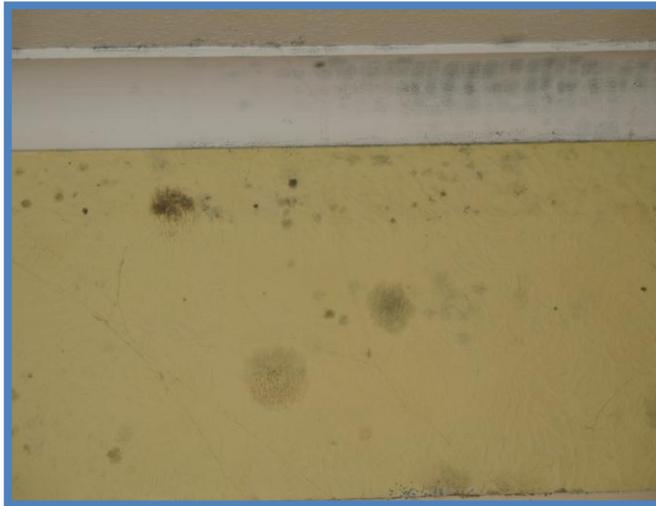


Photo 4:
Mold on the crown molding – kind of ironic!
Removal and replacement of the textured plaster walls and ceilings, as well as the plaster crown moldings, would indeed be expensive.

Understanding the Details of the Industry Standard of Care

Fortunately, I was able to remind the contractor of two key distinctions in the mold remediation field. Because of the varieties of materials many remediation contractors legitimately classify building materials into three categories rather than just the two choices of porous or non-porous. A third category called semi-porous is often used to describe materials that are somewhat water resistant rather than waterproof, or items that can be successfully cleaned of fungal contamination rather than having to be replaced. Wooden studs, doors, plaster or wood moldings, completely painted or sealed surfaces, and even masonry products are often classified as semi-porous because fungal contamination can be cleaned without damaging the structural integrity of the items.

Another key factor in advising the contractor that many of the mold contaminated surfaces in this house can be saved was the specific information in the IICRC S520 standard for professional mold remediation. This document has a specific section that implies that painted walls can be treated as a non-porous material. Section 12.2.6 notes that “small isolated areas of mold growth on a surface layer of condensation on enamel painted walls or other non-porous surfaces, where mold growth has not resulted in concealed areas, usually can be removed by HEPA vacuuming and damp wiping as part of a regular maintenance program”.

With this base for the decision making I counseled the contractor that proper cleaning, rather than removal, would be appropriate for many of the impacted surfaces. The painted walls, ceilings, skirting boards, fire surrounds, and window trim and sills can be cleaned and coated with an anti-microbial paint. I even noted that if the doors and hatch were solid wood, particularly hardwood that is varnished or painted, then they could be cleaned and coated unless they were warped or damaged in such a way that necessitated replacement. I did warn him that if the doors were hollow core construction, even if they were painted, that I would replace them rather than take the chance that mold is left inside where it cannot be addressed.

Choosing the Best Approach

So now the question was what is the best method for cleaning the mould in this particular structure? There are several options that could be used, including the HEPA sandwich⁷ approach where the damp wiping in the middle of the process is really a wet scrubbing with spray bottles and plastic scratch pads. This is very labor intensive. Another approach would be to use a blaster with a soft media such as sponges to try to remove the paint film and mold from the surfaces without doing significant damage to the underlying substrate. This would not be my first or second choice because of the expense of the media and the setup that would be necessary to control the blast residue. Another option would be to try steam cleaning, but my concern was that the contractor would add so much moisture and heat from the process that he would further damage the plaster.

With those approaches considered and ruled out my best suggestion was to try a foam cleaning system. We have had a number of contractors have great success with this process and find it to be very cost and labor effective – particularly for structures that have a lot of surface area to be addressed. The foam cleaning systems are primarily of two types: activated hydrogen peroxide or standard anti-microbial cleaners that are applied by specialized spray equipment as foam rather than liquid droplets. Although I am not a foe of products that use aggressive oxidizers such as hydrogen peroxide I did not think it would be the best approach for this project because using such chemicals can be dangerous, special training is needed, and it is fairly expensive since there are limited distributors in Great Britain. However, I did offer to put the contractor in touch with the owner of the company who manufactures the best version of those products in the United States if he wanted to try that approach.

My overseas client was a bit surprised to find that a number of standard antimicrobial cleaners can be turned into foam that will stick to vertical surfaces. Although they have their own manufacturers of such chemicals in Great Britain the ones that our organization has seen used with the most success are Unsmoke products such as *QGC* and Fiberlock products such as *Aftershock*. I even provided the contractor with a copy of an article related to the “Pittsburgh Protocol” which explained this foam cleaning process in more detail.⁸

From Generalities to Specifics

Still, adopting a general approach and having specific steps to follow are two different things. Therefore, I outlined what a typical scope of work for such a project would look like:

1. Determine who is going to conduct post-remediation testing, explain your process, and make sure you completely understand the criteria that they will use to judge the success of the remediation effort. Adjust the following work steps as necessary to meet their criteria or direction.
2. Ensure that the original moisture source is corrected.

3. Isolate the entire structure to prevent cross-contamination of mold spores from the interior to the exterior (particularly important if there are nearby structures).
4. Establish negative air pressure and maintain it throughout the process to remove spores from the air.
5. Fog the structure with an anti-microbial to arrest growth and provide some additional safety for the workers.
6. Remove, bag, and dispose of all porous materials that are contaminated with mold growth such as wallpaper, insulation, carpet, carpet pad, draperies, upholstered furniture, etc.
7. Make a determination regarding the removal or cleaning of impacted materials such as wood skirting boards, doors, hatches, wood trim around the fireplace, windowsills and trim, etc. This determination should be based on the type of material, amount of damage, and replacement cost.
8. On a room-by-room basis apply antimicrobial foam; agitate with brushes with medium stiff bristles (plastic scrub brushes, not wire).
9. Spray with additional antimicrobial cleaner and wipe mold and foam residue from all surfaces until clean. Note that colored staining may still be visible unless foam cleaner includes hydrogen peroxide or bleach. The colored staining does not need to be addressed at this phase of the operation if additional painting will be part of the project. Remember that mold does not have real roots—the mycelial mat sits on the top, a few microns off the surface.
10. Continue advancing from room to room following the airflow that is created by the negative pressure. It would be beneficial to have an extra negative air machine running as an air scrubber with a diffuser tube on the back of the unit in the room where work is conducted.
11. Depending on the environmental conditions, the amount of surface area being cleaned at the time, and the amount of moisture in the foam that is applied, dehumidification or other drying procedures may be necessary.
12. HEPA vacuum all surfaces after they are dry.
13. Collect air and surface samples as a part of internal quality control to ensure that the cleaning process was effective. This step can be taken after the first room is completed in order to gauge the effectiveness of the process while the contractor is still working rather than waiting until the end, just in case adjustments need to be made to the process.
14. After the remediation process has been completed and the structure has met the contractor's internal quality control standards, call for the independent post-remediation inspection and testing. Remind the investigator that colored staining is not an indication of active mold growth.

15. After verification of successful post-remediation testing is received apply anti-microbial paint in a professional manner. Depending on the product used, multiple coats may be necessary to cover all stains.
16. Refinish floors as necessary.
17. Complete restoration to return the structure to a pre-loss condition.

Working Within the Standard of Care to Find Cost Effective Solutions

Professional mold remediation results from the efforts of individuals who have had enough training to understand the details of the standard of care and yet have the vision to look at each project in a unique and creative way. Protecting the health of the workers, the health of the occupants, and the value of the structure should always be paramount on such projects. Still, there are many cases where effective mold remediation does not have to entail full scale rip and remove practices. And it is just as clear that good approaches to mold remediation can be practiced around the globe regardless of where they originate.

NOTES

¹ Remember, the English and the Canadians put a “u” in the word mold.

² Specifically, controlled demolition utilizing appropriate engineering controls such as HEPA-filtered negative air machines, construction of isolated work areas and decontamination chambers, bagging and sealing of waste materials that will be transported through non-impacted areas of the structure, and appropriate disposal.

³ English term for the decorative areas around a fireplace.

⁴ Another cool term from the British Isles for a baseboard (which can also be referred to as mopboard in Canada, floor molding by highfalutin architects, and base molding by clerks at the lumber yard) which covers the lowest part of an interior wall.

⁵ You would think that as inventors of the mother tongue of our native language the residents of Great Britain would call it cove molding.

⁶ In a general sense, this Italian derived word refers to the moldings or other elements framing a door, window, or other rectangular opening. For classical architects it has a specific meaning and refers to the lintel that sits on the columns to form the top of a door opening. Personally, in classic architecture I prefer the simplicity of the Tuscan style architrave to the more ornate Doric, Ionic, and Corinthian styles.

⁷ A term used to describe a three-step cleaning process where HEPA vacuuming is performed as the first and last step with damp wiping or some other form of cleaning as the middle step. Obviously, the terminology refers to the HEPA vacuuming as the two pieces of “bread” on the

outside of the sandwich with the damp-wiping as the “meat” of the process. My thanks to friend and professional colleague Rachel Adams for introducing me to this term.

⁸ Another call-out to my good friend Cliff Zlotnick for his work in developing and publicizing this cost effective cleaning technique. As Cliff says, “It must get wetter before it gets better”.

About the Author

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