



FREQUENTLY ASKED QUESTIONS (AND ANSWERS) ABOUT THE CLEANING OF RESERVOIRS: Whole Structure Cleaning

Q 15: My house has carpeting throughout. How can mold be removed from the carpets?

A 15: Before beginning a discussion about specific cleaning techniques, it is critical that we lay out the ground rules. If the carpet has visible mold growth it should be removed and replaced. Just as important, the removal should be done in a controlled fashion so that the potential for cross-contamination is reduced. Rather than carpeting, sensitized individuals should consider hard flooring and area rugs that can be removed from the structure once or twice a year for thorough cleaning and drying.

If wall-to-wall carpet must stay in an area where mold contamination was identified, a careful visual inspection needs to be conducted to ensure that no mold is growing on the carpet. In areas where the carpet abuts water-damaged building materials it may be necessary to release the carpet from the tack strips and inspect the underside and the pad.

For carpets that are acting as a reservoir for spores dispersed from actual growth areas (known as *Condition 2* in one of the restoration industry's more respected guidance documents) it is possible to have deep carpet cleaning conducted. The best results are achieved using a three-step system that involves HEPA vacuums and commercial hot water extractors. (If the location/configuration of the structure allows it, we strongly recommend truck-mount extractors). First, the carpets are thoroughly vacuumed, then hot water extraction is conducted, and, finally, another vacuuming is done. Obviously, such cleaning would also entail appropriate quick drying between the two vacuum steps to prevent microbial growth in the carpet.

If you are chemically sensitive, rather than using standard cleaners and biocides, careful extraction using plain water (or using water that has had the pH altered to make it more alkaline) would clean without leaving chemical residues. Depending on the age and condition of the carpet, double extraction cleaning with drying and HEPA vacuuming between may be necessary.

Q 16: Which chemicals should be used for cleaning mold? Recommendations from people that claim to know about mold and sensitized individuals include Formula 409, borax, thieves oil, bleach, dish soap, or dishwasher detergents.

A 16: Chemical selection is probably one of the most difficult issues faced by sensitized individuals when deciding how to address a mold-contaminated environment. Part of the problem is that mold sensitivities often induce cross sensitivities to chemicals. Another

issue is the effectiveness of the cleaning products in removing mycotoxins along with mold spores and other contaminants. A third consideration is having an antimicrobial impact to help address some of the complications from bacteria and other microorganisms that are also part of the water-damaged environment.

Several popular websites suggest using Formula 409. We do not recommend it because we cannot verify its efficacy for microorganisms. It is probably mentioned on these sites because Formula 409 is a consumer brand of a quat cleaner—a quaternary ammonium compound. Quats may leave a residue or break down quickly. It depends on what the formulation is, and whether or not a biostat (something that keeps organisms from growing) is added to the biocide (something that kills existing organisms). Quats are recommended for mold work because some research suggests that they are better at removing mycotoxins from surfaces than are regular cleaners. A number of quat-based antimicrobial cleaners are available at both consumer and specialty sites. Since the landscape is constantly changing in regards to chemical formulations, we encourage our clients to contact us for help with such decisions in order to match the best products to their specific needs.

In addition to quaternary ammonium compounds, several other classes of chemicals are often used for mold remediation work. Hydrogen peroxide cleaners are effective at removing and killing a variety of microorganisms, however, they require the use of better personal protective equipment by the user and are more likely to damage or bleach out the material being treated. While it seems like such products should work well on mycotoxins, we have no research to verify that. One company has even marketed a line of products—including a hydrogen peroxide style cleaner—specifically to sensitized individuals.

Then there are essential oil products, an entirely different category of mold cleaners. Essential oil cleaners leave a residue. While their effectiveness against microorganisms is well documented, there is little evidence of their ability to remove mycotoxins.

Salt-based and acid-based products seem to work well on microorganisms. Formulations that boost the effectiveness of bleach can be valuable for stain removal, but generally should not be used as an antimicrobial. As noted for other products, there is little evidence of their ability to remove mycotoxins.

With all this in mind, we recommend that clients use a cleaning solution that is the least dangerous and has a positive impact on both microorganisms and mycotoxins. This brings us back to quats, with many choices of commercial grade cleaners with verified performance for restoration work. Still, there are several cautions and exceptions to this advice. If you are using microfiber cloths (either washable or disposable), then stay away from quats. Recent hospital studies have identified a phenomenon called “quat binding”, where the combination of microfiber and quats actually decreases the overall effectiveness of each. If you want to use microfiber cloths (which do a better job of capturing small dust particles), then the research suggests matching them with peroxide style cleaners.

In all cases, the sensitized person should check the product before it is used to see if it is tolerable. Rather than sticking their nose in the bottle of cleaning solution, the product should be prepared for use and applied to a non-porous item like a cutting board, and then the sniff test be done after it has set for a few seconds. If that does not cause problems, then a second test with a spray of the product onto a porous item like a clean rag or dishtowel is performed. This will also help determine if the cleaner is safe for fabrics.

This is a lot of information to digest, but we are blessed with a great variety of good products that work well for specific aspects of mold remediation. We just have to choose wisely based on each particular situation.

Q 17: I keep hearing about the HEPA sandwich. What is it?

A 17: HEPA sandwich cleaning is a three-step process that starts and ends with a thorough HEPA vacuuming. Between the two vacuumings a damp or wet cleaning process, generally with an antimicrobial cleaner, is employed. Depending on the surface being cleaned, the wet/damp cleaning process can utilize hot water extraction, spray and wipe, or damp antimicrobial cleaning cloth methods.

Q 18: Please explain “air scrubbing” and “air washing”.

A 18: Air scrubbing is the process of using HEPA-filtered negative air machines to recirculate the air in a specific work area rather than exhausting air to the out-of-doors. For Wonder Makers’ projects, air scrubbing always includes a perforated section of lay-flat poly “tail” on the exhaust side of the negative air machine to diffuse the air. The tail should be 8-10 feet long and sealed at the end. The perforations should be cut in the shape of an arc and distributed over the length and sides of the tail.

Air washing is the utilization of an air stream (generally from an air compressor with a fan style nozzle or from an airless sprayer) to dislodge residual or suspected contamination from previously cleaned surfaces. Air washing can be conducted dry or with a light mist and is completed in a logical pattern (top to bottom and back to front) in an effort to move microscopic contaminants toward an exhaust fan or HEPA-filtered negative air machine. Misting can be used if all the surfaces in the area are water resistant and appropriate drying equipment is utilized.

Q 19: Some websites state that fogging should not be used for remediation. Are there situations where fogging can be used?

A 19: Fogging is not a substitute for remediation. Source material should be removed. Contents should be cleaned. HVAC systems should be cleaned. But, once those activities have been completed, fogging may be useful in that it assists in dropping airborne dust, mold, etc. out of the air and onto surfaces, where they can be HEPA vacuumed and/or wiped in order to remove them.