



Advanced Mold Remediation

**Fort Hood Garrison Command
Directorate of Public Works**

New Photo-Catalytic Reactor



Fort Hood DPW: Test Site #2



- Recently the Fort Hood Directorate of Public Works has begun testing a new mold remediation technique to more efficiently and effectively clean mold situations.
- As seen in the example above, the process has had some staggering results.



Advanced Mold Remediation



- Benefits
 - Lower Cost
 - Non-Destructive
 - Faster Turn-Around
 - Much Lower Post-Remediation Spore Counts
 - Recovers Most Furnishings, Including Cloth Goods
 - Long-Term Mold-Prevention System Left in Place
 - Work Guaranteed



New Technology = New Capabilities



- Photo-Catalytic Reactor Based
 - Produces Hydrogen Peroxide Gas
 - A true gas – not an aqueous vapor
 - H_2O_2 produced from water vapor and oxygen already in the air
 - Continuous production of 0.02 ppm
 - Safe – 1/50th OSHA limit
 - Uses Ambient Temperature and Humidity



Fort Hood DPW: Test Site #1



- Building 39013, Room 312
 - Mold intrusion caused by minor flooding and HVAC condensate back up
 - Before and After pictures include upholstery that in other situations could not have been saved
 - Furniture savings per room range between \$1500 and \$6000 depending on the number of upholstered items, mattresses, and heavily mold stained wood

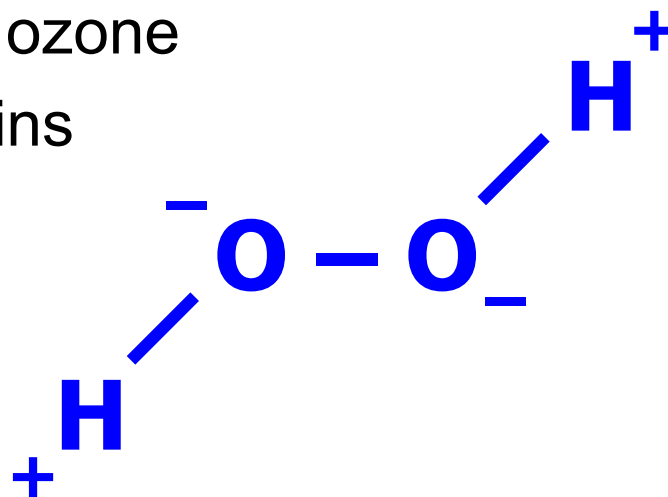




Hydrogen Peroxide Gas



- Similar to water in structure
- Has both + and – charges
- Drawn to mold by electrostatic attraction
- Kills mold 20 times faster than ozone
- Chemically degrades mold toxins
- Also kills viruses and bacteria





Mold and Other Fungi



- Fungi...
 - are designed to absorb water
 - attract water electrostatically
 - also attract hydrogen peroxide
 - are defenseless against hydrogen peroxide gas





Non-Destructive Remediation



- Process temperature and humidity process does not induce sporulation
- Mold is killed cell by cell down to point of attachment
 - Dead hyphae release from surfaces
 - Effective surface removal is then possible
 - Removal of structurally sound material is no longer necessary
- Hydrogen peroxide gas also diffuses into cloth and other porous material, killing mold
 - Cloth furniture, bedding, books, etc. can be saved
- Injection process kills mold behind walls
- Only limited surface refinishing is required after remediation to restore area to full use



University Testing



- Kansas State University
 - Dr. James Marsden, Regents Distinguished Professor, Department of Animal Sciences & Industry, K-State Food Science Institute
 - Microbial reduction on surfaces (Mold, Bacteria & Virus)
- University of Cincinnati
 - Dr. Sergey Grinshpun, Department Head, Center of Health Related Aerosol Studies, Department of Environmental Health
 - Reduction of the Aerosol Particle Concentration
 - Airborne Microbial reduction
- Sandia National Laboratories
 - Jill Bieker, Ph.D.
 - James L. Marsden, Ph.D.
 - Inactivation of Avian Influenza



The Bottom Line



- 33% to 66% savings on Total Dollars spent per job
- Faster turn around
 - Shorter execution time
 - No delay for reordering of furniture
- Less administrative cost
 - Fewer construction inspection hours
 - No furniture reordering administrative hours
- Fewer dollars paid out per project



Fort Hood sets new standard for mold remediation

by Brad Britain and Christine Luciano

Every Soldier deserves a clean, healthy work and home environment free from mold and mildew. The Fort Hood, Texas, Directorate of Public Works is actively addressing the problem of mold and mildew growth in barracks and other facilities. To bring this recurring and costly problem under control, DPW has used a new strategy for mold remediation and prevention for the past year and a half.

Contracting officers worked with the DPW facility management team to research, test and implement a strategy that uses hydrogen peroxide gas to treat mold and bacteria. DPW coordinated with an industrial hygienist in Preventive Medicine to test the hydrogen peroxide gas process.

The first and second test trials were successful in eliminating mold and mildew. The Texas State Board of Health was originally skeptical about the process. However, after seeing the rooms and reading the test results, the board chose to move forward on an experimental basis.

The high-tech air purification system is a combination of two technologies — ionization and commercial infection control technology. The system is a process that produces a very low concentration of hydrogen peroxide gas from oxygen and water vapor already in the air and then disseminates it into the facility. The hydrogen peroxide gas first sanitizes the air ducts, then sanitizes the air and exposed surfaces in the building reaching, over time, into every crack and crevice that air can penetrate, disinfecting microbes in places that other processes cannot reach.

The hydrogen peroxide gas is odorless and safe to use in occupied areas. According to the Occupational Safety and Health Administration, 1 part per million of hydrogen peroxide gas is safe throughout the work day. **Ozone-free CIMR infection control technology uses only one-fiftieth of that amount.**

Acronyms and Abbreviations

DPW	Directorate of Public Works
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“The problems with the barracks, mess halls, chapels and other facilities across the installation originated with heating, ventilation and cooling system malfunctions; leakage of water into the building from pipes and through walls and roofs; and old building designs,” said Jay Glazener, DPW facility manager.

Previously, Fort Hood’s approach to managing mold and mildew problems included two basic options. First, wipe down the walls, throw away bedding and upholstered materials, and paint the walls. Second, tear out the walls and discard all furniture and bedding, effectively gutting and renovating the entire area, along with all adjacent areas.

“The new process is an efficient, cost-effective solution to battling mold and mildew,” Glazener said.

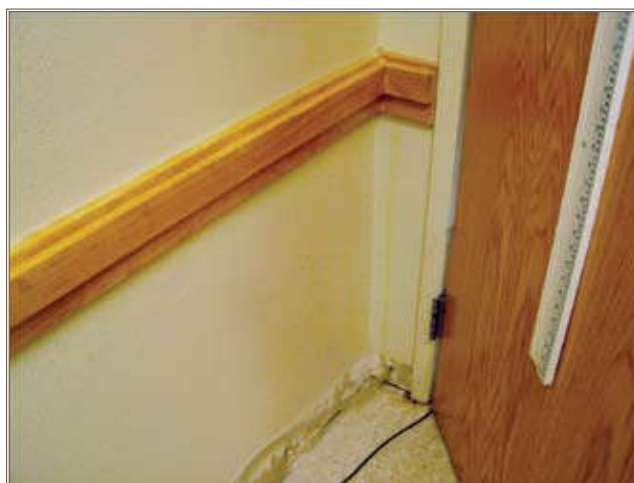
George Henderson, a licensed mold inspector and tester for the state of Texas was asked whether leaks have to be fixed with this process.

“Yes, you have to fix the leak, but you do not have to tear everything out,” Henderson said. “I have witnessed some amazing things with this technology, from saving artifacts at Spindletop Museum in Beaumont, Texas, to eradicating mold and then keeping mold from growing back in a nine-story building that had no roof for months after Hurricane Rita.”

The hydrogen peroxide gas process has



Before treatment, this barracks room wall is covered with mold. Photos courtesy of Pat Fields



After the room was treated with the hydrogen peroxide gas process, the same wall shows the mold and mildew have been eliminated.

also been used by the Navy, the Federal Emergency Management Agency, the National Historical Society, Lamar University, the Texas Educational System and the Army Corps of Engineers.

At Fort Hood, more than 100 barracks rooms, a dining hall and a section of the Keith Ware Hall have been treated. The process effectively eliminated mold and mildew growth and has never failed. Rooms that were completely covered and looked black with mold are now pristine.

In addition to the clean up, an ultra-violet air purification system is placed ➤