

PROBLEM CHINESE DRYWALL REMEDIATION REPAIR GUIDELINES **(CDW REMEDIATION PROTOCOL)**

Introduction

Homeowners in several states have reported unpleasant odors; occupant irritation; tarnishing of copper and silver materials; as well as high rates of HVAC coil failures. These problems appear to be the result of the release of reactive sulfur gases from problem/corrosive Chinese drywall.

The goal of these Chinese Drywall Remediation Repair Guidelines (Repair Guidelines) is to clean or remove *building materials* affected by the presence of problem/corrosive Chinese drywall and to restore the home in a manner to assure that there are no further Chinese drywall related odors or detectable emissions/ corrosive gases or home owner irritation.

These Repair Guidelines are designed to achieve this goal; however, they are not meant to exclude other similarly effective methods and should be supplemented by a site-specific work plan based on the nature of the construction methods used in the jurisdiction in which the home is located.

These guidelines are in Draft format and are made available as a public service for use by qualified Environmental Consultants only. These Repair Guidelines may not be suitable for your specific requirements. These guidelines are for the cleaning and removal of building materials in unfurnished homes.

Guidelines are subject to change as more information regarding this topic becomes available. Use these Draft Repair Guidelines at your own risk.

Task Force Recommendation

According to the Federal Chinese Drywall Task Force (Task Force) recommendations released 4-2-10, homes do not need to be gutted down to the block walls in order to provide safe, healthy living environments.

The Task Force found no health or safety reasons to remove non-problem drywall, AC units, insulation, plumbing, or ducting.

The Task Force recommends that in addition to removing problem drywall, the following 3 items must be removed and replaced with new even if there is no indication of damage:

1. All fire safety alarm devices (including smoke alarms and carbon monoxide alarms);
2. All electrical components and wiring (including outlets, switches and circuit breakers); and
3. All gas service piping and fire suppression sprinkler systems.

Goals

The goal of Chinese Drywall Remediation Repair Guidelines (Repair Guidelines) is to meet all Task Force recommendations plus "Eliminate any evidence of prior problems that could negatively impact a home's resale value". Which means clean or replace visibly tarnished copper plumbing or HVAC equipment and replace any tarnished mirrors.

As a result these Repair Guidelines will:

- Permanently eliminate all detectable odors.
- Permanently eliminate all problems associated with Chinese drywall corrosive gas emissions.
- Permanently eliminate any occupant irritation that may be caused by Chinese drywall corrosive gas emissions.

CHINESE DRYWALL REMEDIATION REPAIR GUIDELINES

- Eliminate any evidence of prior problems that could negatively impact a home's resale value.
- Restore the home to a safe living environment.

Repair Guidelines

Our Problem Chinese Drywall Remediation Repair Guidelines (Repair Guidelines) provides a practical approach to remove and replace the problem Chinese following Task Force recommendations.

There is no one-size-fits-all Chinese drywall remediation protocol. Therefore we make an MS Word Doc version of these Repair Guidelines available at www.Chinese-Drywall.org that can be modified by qualified Environmental Consultants to meet specific client needs.

These Repair Guidelines are intended for use by those who will be undertaking repairs to: (1) detached, single-family homes, and (2) attached multi-family dwellings that are three stories or less (whether fee simple or condominium) and are constructed such that each distinct dwelling unit is separated vertically from adjacent units by a concrete masonry unit party wall.

All homes with problem Chinese drywall also have some good drywall. The good drywall does not have to be removed in order to meet the requirements to restore homes to safe and healthy living environments.

Our Repair Guidelines recommend removal of only the problem drywall so long as the problem drywall can be adequately identified as such. Otherwise remove all drywall.

Adequate testing that can pinpoint the problem and non-problem drywall can often significantly reduce the cost of remediation by reducing the amount of drywall that needs to be removed.

See Chinese Drywall Assessment 101 at www.Chinese-Drywall.org for more information on assessing Chinese drywall.

Note that not all brands of Chinese drywall are problematic. There are claims that some US made (synthetic) drywall may be problematic although we have not seen any US drywall that meets the Florida DOH guidelines for problem drywall.

Removal and Repair Guidelines are based on a 10 Step Procedure: ① - ⑩

① Relocation of Home Owner

These Repair Guidelines are for the remediation of the building materials in an unfurnished home. Due to the scope of the repair work it is necessary for all occupants of the home and all personal belongings to be relocated during the repairs.

Upon completion of the repairs and receipt of a Certificate of Occupancy/Certificate of Completion from the applicable building department, the occupants and their belongings may be returned to the residence.

Note: Prior to belongings being returned to the home, the electrical contractor should inspect all appliances and lamps (all electrical devices with particular attention to appliance or lamp cords) for proper operation and for any evidence of corrosion or abnormal discoloration to metal components. Replace any such affected appliances or retain authorized repair service to remove and replace affected damaged components prior to reinstalling in home. If there is no evidence of any such damages, reinstall appliances at conclusion of remediation work.

② Permitting; Licensed Contractors

All permits and work authorizations required by applicable local governmental authorities shall be obtained prior to commencement of the repair work. Licensed contractors and subcontractors, as required by applicable building codes, shall be used to perform or oversee the repair work.

CHINESE DRYWALL REMEDIATION REPAIR GUIDELINES

③ Worker Safety

Drywall removal significantly elevates the sulfur gas levels inside of homes under demolition. Adequate ventilation is a must to ensure healthful working conditions. Make sure all windows and doors are open during work hours. High-performance 36" drum fans and 30" pedestal fan should be used to ventilate work areas.

Workers should be equipped at a minimum with N-95 face masks to keep them from breathing Chinese drywall dust during demolition. Masks with exhaust vents such as the 3M 8511 will last longer and are more comfortable than non-vented masks. Expect that each worker may use up to 3-4 of these per day. Some workers that are sensitive to drywall gases may need to be fitted with half or full face masks that accept 3M 6006 Multi-Gas/Vapor Cartridges.

Respirators alone should not be relied upon to keep workers safe from Chinese drywall dust and sulfur gases. Proper ventilation is imperative.

To help reduce the level of sulfur gas during remediation work, drywall and drywall dust should not be allowed to accumulate on the floors. During the demolition, one or more laborers should be dedicated to continuously remove drywall from the home and continuously vacuum small drywall pieces and drywall dust from floors.

Vacuum up small debris and construction dust using a wet vac equipped with a *drywall* filter bag (http://www.shopvac.com/shopvac-accessories/Products/Drywall-Collection-Filter-Bags-for-10-14-Gallon-Tanks_906-72-00.aspx.)

HEPA Vacuum that filter sub-micron particles are NOT required.

Air scrubbers or Negative Air machines that filter sub-micron particles are NOT required.

Workers should bring a change of clothes so they do not track Chinese drywall dust into their vehicles or homes.

④ Protect flooring and Driveways

Driveways and flooring should be protected to prevent damage during repairs. Repair or replace any flooring or driveway damaged during the repair process. Most people choose to remove and then later replace *worn* wall-to-wall carpet and padding rather than cover and later clean.

Protect stairs and railings.

Cover all HVAC ducts, grilles and registers to prevent construction debris and dust intrusion during the repair process.

⑤ Removal of Cabinets & Mirrors

Remove all cabinets, countertops and back splashes, light fixtures, fans, mirrors, toilets, bidets door casings, window sills to provide access to problem drywall that will be removed. Save for later re-installation.

- (1) Kitchen cabinets on islands may not need to be removed. If any cabinets and countertops will not be removed be sure to carefully protect, as workers will always place tools on any horizontal surfaces.
- (2) If mirrors or plumbing fixtures show any signs of abnormal discoloration, replace with new materials.
- (3) Remove and number baseboard and crown molding on a per room basis for later reinstallation.
- (4) Remove and later reinstall all shelving and closet systems.
- (5) Remove and then have electrical contractor inspect all appliances for proper operation and for any evidence of corrosion or abnormal discoloration to metal components. Replace any such affected appliances or retain authorized repair service to remove and replace affected

CHINESE DRYWALL REMEDIATION REPAIR GUIDELINES

damaged components prior to reinstalling in home. If there is no evidence of any such damages, reinstall appliances at conclusion of remediation work.

6 Removal of Building Materials

Building materials affected by the repair process shall be handled as set forth below, however the manner and order in which the following are performed shall be at the discretion of the parties making the repairs. The work being performed shall be in accordance with all applicable building codes and all work shall be approved by local permitting authorities.

- (1) Remove and replace problem Chinese drywall (walls and/or ceiling). There may be some small inaccessible areas of original drywall left that have been shown to not impact indoor air quality and does not show up on post-remediation air sampling clearance testing.
If you cannot adequately distinguish problem Chinese drywall from non-problem drywall remove all drywall.
- (2) Tile backer board is not Chinese drywall and does not need to be replaced if it can be properly identified.
- (3) There has been no UL approved 5/8" fire-rated corrosive Chinese drywall imported into the US. Walls separating a home from a garage; and common walls in many multi-family residences are often but not always made from fire-rated 5/8" drywall. Such firewalls are not problem Chinese drywall. Firewalls DO NOT need to be replaced if they can be properly identified.
- (4) Problem Chinese drywall should be discarded only in Class I landfills per State of FLA guidelines. http://www.dep.state.fl.us/waste/quick_topics/publications/shw/solid_waste/policymemos/SWM-19-17.pdf
- (5) Per Task Force recommendations, remove and later replace all electrical wiring, receptacles, switches and circuit breakers.
- (6) Remove and replace electrical switch/receptacle boxes if there is drywall finish overspray or paint inside boxes that could make it difficult to do a visual inspection for the complete absence of Chinese drywall dust in such boxes. Even very small amounts of Chinese drywall dust in such boxes can result in tarnishing of copper electrical wiring even after all Chinese drywall has been replaced. Boxes need to be pristine.
- (7) Per Task Force recommendations, remove and replace all smoke and carbon monoxide detectors.
- (8) Per Task Force recommendations, remove and replace all gas service piping and fire suppression sprinkler systems
- (9) Based on recommendations from state licensed plumbing contractor, clean or remove and replace all black-discolored portions of copper plumbing and copper or brass connections. If cleaned, use appropriate cleaner to remove all visible signs of such discoloration.
- (10) Based on the recommendation from state licensed AC contractor, clean or remove and replace copper HVAC air handler coils that show evidence of copper corrosion and remove and replace all HVAC associated electrical components such as thermostats. DO NOT REMOVE AIR HANDLER(S) AT THIS STAGE OF THE REMEDIATION.
- (11) Insulation, air ducts, air handlers, AC compressors, plumbing, water heaters, appliances, do not have to be replaced unless the appropriate state licensed contractor deems replacement necessary for safety reasons.

7 Corrosive Gas Baseline Control

Upon completion of the job, post-remediation clearance (PRC) testing, performed by a qualified Environmental Consultant, will be expected to find no elevated corrosive sulfur gases within the home if the remediation work has been properly performed.

CHINESE DRYWALL REMEDIATION REPAIR GUIDELINES

Typically this testing will be either corrosion testing or air sampling with lab analysis.

In order to make sure the PRC testing procedures are working properly, during the remediation work and before any ceiling drywall is removed, the indoor air should be tested by the same procedure that will be used to perform PRC. Upon completion of the remediation work the PRC test will be compared to this baseline control. If the testing procedure is working properly, the test taken during the remediation will result in a positive reading. And if the remediation work has been properly performed the post-remediation clearance test results will be negative.

8 Cleaning and Inspecting Prior to Rebuild

After all of the problem Chinese drywall has been removed from the home as provided above and before rebuild or reinstallation or replacement of any items in the home, the following procedures should be followed. We recommend that a qualified Environmental Professional perform the inspections:

- (1) Conduct a visual inspection of remaining building components for any damage from the problem Chinese drywall or drywall removal and clean or replace affected components.
- (2) Vacuum up small debris and construction dust using a wet vac equipped with a drywall filter bag (http://www.shopvac.com/shopvac-accessories/Products/Drywall-Collection-Filter-Bags-for-10-14-Gallon-Tanks_906-72-00.aspx). Drywall dust can be sticky. Follow vacuuming by mopping and/or scraping to eliminate all settled drywall dust on floors, inside window areas, and inside wall framing. Some of the framing members will have to be disassembled to provide complete access for cleaning. There should be no drywall dust in electrical receptacle boxes. If this cannot be guaranteed, replace receptacle boxes with new.
- (3) To properly clean insulated walls you may have to remove insulation first. If the insulation is foil backed insulation often found on exterior block walls, this can later be reattached and then problem areas repaired. It is usually cheaper and more effective to simply replace any fiberglass wall insulation that becomes contaminated with Chinese drywall dust than to attempt to clean. Judgment should be used.
- (4) Some builders are removing carpet tack to facilitate cleaning. If the carpet tack had been installed onto 2nd floor Gyp-Crete sub-flooring, the Gyp-Crete will most likely be damaged when the tack is pulled up, requiring Gyp-Crete repair. We do not see any reason for pulling up carpet tack. It is not damaged by the Chinese drywall gases.
- (5) Upon the elimination of all detectable settled dust, have a qualified Environmental Consultant fog floors, wall cavities, air spaces and remaining non-problematic drywall with Oxine (<http://www.bio-cide.com/>) or strong bleach using appropriate safety precautions. Particular attention should be applied to fogging any plywood that had defective Chinese drywall installed up against it. The easiest way to safely fog the residence is to run the Air Handler fans with AC=OFF and FAN=ON, and output the Oxine or Bleach into the AC return air flow so that the HVAC system distributes the Oxine/Bleach to all areas of the home as well as the AC lining and ducting. For this procedure you will need to remove the protective dust coverings on the supply and return air grills and then re-cover once the fogging is complete.
- (6) Repeat #3 as needed. Air handler(s) located in AC closets that need drywall rebuild will need to be removed after this step.
- (7) The residence should then be inspected for cleanliness by a qualified Environmental Consultant. The absence of all problem Chinese drywall and absence of drywall dust and absence of any odors should be documented at this time. Upon completion of such documentation the consultant should give the go ahead for the rebuild.

There are currently no state licensing or standards for inspecting Chinese drywall. Until such time that there are such standards the minimum educational, training, experience and insurance requirements for a qualified Chinese drywall environmental consultant should

CHINESE DRYWALL REMEDIATION REPAIR GUIDELINES

follow those for a FLA mold assessor/ consultant as stipulated in FLA SB2234 Mold Licensing Law to go into effect 7/2010.

9 Rebuild and Post Remediation Inspection

- (1) Upon receiving the Okay from the qualified Environmental Consultant on the cleanliness and odor-free status of the job site, drywall replacement can begin.
- (2) After the rebuild is complete, the qualified Environmental Consultant should take a post remediation test checking for the presence of corrosive sulfur gases.
- (3) If the job does not pass then either all the problem drywall was not removed and/or dust from the problem drywall was not completely cleaned from the premises. In which case you are glad you hired an Environmental Consultant with Errors & Omission Insurance for Chinese drywall for surely there have been either errors and/or omissions in the work performed.

10 Re-occupancy

The home will be ready for re-occupancy upon receipt of Certificate of Occupancy from local permitting authorities as well as a Chinese-Drywall Free certification from the environmental consultant.

References and Resources

For additional information, refer to the following governmental agencies:

US Consumer Product Safety Commission - <http://www.cpsc.gov/info/drywall/index.html>

Florida Department of Health - <http://www.doh.state.fl.us/environment/community/indoor-air/drywall.html>