



**TO: CHINESE DRYWALL COLLEAGUES** **JAN 2, 2009**  
**FR: GARY ROSEN, PH.D.**  
**RE: WHAT WE HAVE LEARNED IN 2009. AND SOME THINGS WE HAVE NOT LEARNED IN 2009 BUT HOPE TO LEARN IN 2010.**

**1. HOW MUCH PROBLEM CHINESE DRYWALL IS OUT THERE? HOW MANY HOMES ARE AFFECTED?**

According to the NOV 23, 2009 CPSC Executive Summary:

*At present, the two metrics available for drywall full scope estimates, total imports and consumer complaints, both hold uncertainties. From the seven million sheets of Chinese drywall imported between 2000 and 2009, it is difficult to estimate the number of houses that might contain the drywall because a house could have just one or many sheets. Furthermore, CPSC does not yet know how many of these drywall sheets may be problematic. On the other hand, the over 2000 complaints received by CPSC probably do not include all affected consumers. A homeowner might not report their concerns because they have not yet associated issues in their home with drywall; or out of a possible fear of the negative consequences of owning a property with Chinese drywall. Nevertheless, actual reports of drywall concerns may offer the best means for evaluating the scope of the problem drywall issue.*

The CPSC states that they do not know how many of the drywall sheets may actually be problematic.

The 7 million sheets of drywall would result in at least 50,000 problem homes if all the imported Chinese drywall were problematic.

On Sept 22, 2009 Inez Tenenbaum head of the US CPSC stated: “wallboard comes from several Chinese manufacturers, the drywall is not all made the same way and some Chinese drywall does not cause problems”.

So we know that not all Chinese drywall is problematic. The problem drywall appears to originate from gypsum that is mined in and around the Tianjin region of China. Drywall produced from mines located in other areas of China does not appear to be affected.

Clearly much of the imported Chinese drywall may not be problematic as the actual number of complaint homes is only 5-10% of that 50,000 number. Or, perhaps the problem is not as noticeable in much of the drywall.

According to the CPSC, **actual home owner reports may offer the best means of evaluating the scope of the problem.**

On 12-18-09, Florida Department of Health (FLA DOH) released a set of updated guidelines to help home owners evaluate the scope of the problem.

These guidelines are based on an initial screen by the home owner followed by a 2<sup>nd</sup> assessment from a professional to confirm the presence of Chinese drywall.

FLA DOH does not stipulate any requirements for such “professionals”. As there is no State licensing for Chinese drywall professionals, we believe the professional assessor should at a minimum have Errors & Omission insurance with explicit coverage for assessing Chinese drywall. (This insurance requirement would be consistent with the State’s new law for mold assessors requiring mold assessors to carry \$1M of E&O insurance.)

The key aspect of the FLA DOH Chinese drywall guidelines is an initial home owner screening that shows:

- Clear evidence of extensive prior corrosion of copper in wall cavities and
- Proof of on-going corrosion of copper, based on the repeated failure of copper air conditioning coils.

**Criteria 1** (<http://www.doh.state.fl.us/environment/community/indoor-air/casedefinition.html>):

**Sentinel Indicators of Drywall Associated Corrosion (Possible Case = all 3)**

1. The home was constructed or renovated with new drywall since 2001.
2. Observed corrosion of air conditioner evaporator coil exemplified by black corrosion on copper tubing components. *The corrosion can result in refrigerant leakage making it impossible to cool the home requiring coil replacement. Coil failures indicative of this problem typically occur every 6-14 months*
3. Observed metal corrosion, indicated by blackening of **one or more** of the following:
  - copper wires, ground wires, and electrical connectors
  - un-insulated and un-coated copper pipes and fittings
  - chrome-plated bathroom fixtures
  - silver and copper jewelry
  - mirror backing in bathrooms

If you have answered yes to all three of the above indicators, the home meets the criteria for “possible case”. Continue to Criteria 2 or 3 **only** if home meets the criteria for “possible case”. Trained professionals performing home assessments based upon this case definition should use their experience, training, and professional judgment to establish their inspection procedures and sampling strategies. Professional judgment is necessary to determine the number of samples and weight of evidence needed to meet each set of criteria. A trained professional, not the homeowner, should conduct inspections and testing described in Criteria 2 and 3.

**2. THESE SELF-ASSESSMENT GUIDELINES WERE “DEVELOPED FOR PEOPLE TO DETERMINE IF THEIR HOME IS SHOWING SIGNS OF CORROSION AND ODORS FOUND TO BE PRESENT WHEN CHINESE DRYWALL HAS BEEN USED DURING CONSTRUCTION OR RENOVATIONS.”**

**DOES THIS MEAN THAT ALL DRYWALL IN SUCH HOMES IS PROBLEM CHINESE DRYWALL?**

Not at all. In many cases you may have problem



Chinese drywall on one side of an interior wall and non-problem US or non-problem Chinese drywall on the other side of the wall. This could result in the following conditions:

- The copper AC coils are failing.
- There is blackened electrical wiring in the wall cavity that has off-gassing Chinese (problem) drywall on one side but good drywall on the other side.
- The good drywall has absorbed sulfur gases released by the problem board, and if removed and tested using chamber studies will “release” sulfur gases.

The good drywall would appear to be problematic but is not. That is why it is so important to understand what the cause of the drywall off-gassing is. Only when we know the cause of the off-gassing will we be able to truly define *what is* problem Chinese drywall.

### **3. SO, WHAT IS THE ACTUAL CAUSE FOR THE RELEASE OF SULFUR GASES THAT CORRODE COPPER AND PRODUCE ODOR?**

Neither the CPSC, nor EPA nor FLA DOH has made ANY progress in determining the actual origin of the off-gassing. Our firm has an ongoing R&D project to try to determine causation. We suspect the problem is an unstable sulfur-containing contaminant called Marcasite. We should have some updated test results on this subject later this month.

### **4. THERE ARE SOME OLDER HOMES BUILT IN 2001 AND 2002 THAT HAVE CHINESE DRYWALL ALONG WITH TARNISHED COPPER BUT DON'T SMELL. IF THE HOMES HAD AT SOME EARLIER POINT IN TIME EMITTED GASES (AS EVIDENCED BY TARNISHED COPPER) BUT NO LONGER DO SO – IS THE DRYWALL STILL PROBLEM DRYWALL THAT NEEDS TO BE REMOVED?**

According to the FLA DOH guidelines if there is no drywall gas emission that continues to corrode the copper AC coils, the home does not meet the case definition of problem Chinese drywall.

### **5. DOES JUDGE FALLON’S ORDER FOR EVIDENCE PRESERVATION SUCH AS SAVING PIECES OF DRYWALL AND SAVING TARNISHED ELECTRICAL RECEPTACLES ACTUALLY PROVIDE USEFUL EVIDENCE OF LEVELS OF PROBLEM GASES BEING EMITTED BY CHINESE DRYWALL IN AN OCCUPIED HOME?**

According to the CPSC report entitled *Interim Report on the Status of the Analysis of Electrical Components Installed in Homes with Chinese Drywall*:

“Intact electrical insulation (e.g., thermoplastic) on copper wiring protects the underlying copper conductor from corrosion.”

Therefore simply snipping off the corroded ends of copper electrical wiring restores the wiring to like-new.



Since there is no damage to the wiring from Chinese drywall, it is certainly not clear (at least to me) what the value is to collecting evidence of tarnished wiring.

In regard to saving pieces of drywall, according to the Nov 20, 2009 CPSC 51 Home Study page 120 there is limited correlation between chamber testing and in home testing. The types of gases found and the levels of these gases found when pieces of Chinese drywall are tested under lab conditions (chamber studies – see pix above) do not resemble the types and quantity of gases found inside of homes.

Additionally, our studies show that if there is problem Chinese drywall in a home, good drywall will absorb some of the problem gases and WILL produce a false positive for problem Chinese drywall under the highly sensitive lab testing conditions.

So I am not quite sure of the value of collecting pieces of drywall as evidence. Evidence of what? Off-gassing under lab conditions that does not correlate with the actual types of emitted gases nor their levels found in homes?

Again, it is crucial that we learn what the actual cause of the off-gassing is, so that we can accurately define what problem Chinese drywall is and equally important, what it is not.

#### **6. WHAT CORROSIVE AND/OR MALODOROUS SULFUR GASES ARE BEING RELEASED BY PROBLEM DRYWALL IN OCCUPIED HOMES? AND WHAT ARE THEIR LEVELS?**

According to the latest CPSC study, there is a small amount of hydrogen sulfide (H<sub>2</sub>S) in homes but no other sulfur gases detectable.

However according to this same study, the level of hydrogen sulfide found in complaint homes may not be sufficient cause for the rate of corrosion observed in these buildings. This does not give one confidence in their measurements or conclusions.

As described in Section 5.2.3, corrosion of silver and copper coupons was accelerated in complaint homes compared to non-complaint homes. The levels of hydrogen sulfide found in complaint homes may not be sufficient cause for the rate of corrosion observed in these buildings (see Section 5.3). The accelerated corrosion could be the product of synergistic effects of hydrogen sulfide with formic or acetic acid or other species that are ubiquitous in indoor environments, perhaps potentiated by dew points in the vicinity of ambient indoor temperatures as described in Section 5.3.8.1. The mixtures of corrosive species found in the air of these homes have not been studied in relation to health based

We and others find elevated levels of many emitted sulfur gases when we use other methods to collect such gases than those used by EH&E in this CPSC study.

We believe that the EH&E/CPSC collection methods are not suitable for measuring low levels of unstable sulfur gases. The clear Tedlar sampling bags specified by the CPSC for collecting sulfur gases have been shown to be unsuitable for collecting unstable sulfur gases because such gases are light sensitive and the clear bags allow in light.

## 7. WHAT IS ACTUALLY DAMAGED IN CD HOMES FROM THE EMITTED GASES?

AC coils. Electronic components. Not sure what else. Not the copper plumbing. Not the heavily insulated 110/220 electrical wiring. Not the attic or wall insulation. Not any other drywall present that is not problematic.

We have found that home owners that remove ONLY the problem Chinese drywall and nothing else are very happy with the results. There is no smell. There is no longer any copper corrosion. Removing only the actual problem drywall is a relatively low-cost remediation procedure especially because ceilings (at least in FLA) are rarely problem Chinese drywall. Picture on the right is a Chinese drywall home being remediated but leaving the non-problem drywall in the ceiling.



## 8. FOR A POTENTIAL BUYER, HOW DOES ONE ACCURATELY RULE OUT THAT A HOME HAS CHINESE DRYWALL? FOR REMEDIATION PURPOSES, HOW DOES ONE ACCURATELY DETERMINE THE EXTENT OF SUCH DRYWALL GIVEN THAT MANY HOMES WITH CHINESE DRYWALL ARE A MIX OF CHINESE DRYWALL AND NON-CHINESE DRYWALL?

Our firm specializes in this type of testing. See information on our testing procedures at [www.Chinese-Drywall.org](http://www.Chinese-Drywall.org).

According to ALL the government studies, testing for the markers strontium, elemental sulfur and/or carbonate can work many times or even a majority of times but none are completely accurate. None have been shown to be involved in the cause of the problem and may simply be contaminants found in some Chinese drywall but not in others. Our testing procedure is simple, low cost, accurate and does not involve contaminant markers that only work sometimes. We have \$1M of E&O insurance with explicit coverage for Chinese drywall testing.

## 9. WHAT IS THE ABSOLUTE MINIMUM THAT NEEDS TO BE DONE TO A CHINESE DRYWALL HOME TO REMEDIATE THE PROBLEM?

Remove the problem drywall. Clean up absolutely all drywall dust. Replace the drywall with new material that is not problem drywall. Clip the ends of the electrical wires. Clean the tarnish off of the copper plumbing lines.

Picture at right shows a completely black copper AC line being cleaned up nicely with Copper Brite copper polish.

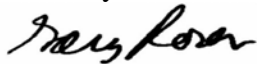


**10. GIVEN THAT THE GOVERNMENT'S NUMBER OF 7 MILLION SHEETS OF CHINESE DRYWALL IMPORTED INTO THE US SINCE 2000 IS ENOUGH TO MAKE AT LEAST 50,000 HOMES, WHY ARE THERE SO FEW DOCUMENTED PROBLEM CHINESE DRYWALL HOMES?**

- a. It could be because much of the Chinese drywall shipped to the US is marginally problematic and not easily noticeable.
- b. Or it could be because much of the Chinese drywall shipped to the US is not actually problematic.
- c. It could be that much of the problem Chinese quickly stops off-gassing problem gases, after initially tarnishing copper in wall cavities and in the air handler ... and is then no longer problematic.
- d. It could be that the off-gassing problems only occur in homes with a certain type of architecture or with certain construction defects?
- e. Possibly other explanations of course. Or perhaps there is a combination of reasons?

Certainly there is still much to learn in 2010. I hope everyone is well and look forward to a happy and healthy New Year for all.

Sincerely,



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