

# *TerranearPMC Safety Share*

## **Week of January 14, 2013 – Drywall from Overseas**

One of the topics for the new 113<sup>th</sup> Congress is a piece of legislation designed to prevent toxic drywall from entering U.S. markets. And President Barack Obama is expected to sign it into law. The bill, sponsored by Sen. David Vitter (R-La.) is an outgrowth of problems with Chinese drywall used to rebuild homes after Hurricane Katrina. In March of 2010, the U.S. Consumer Product Safety Commission (CPSC) requested assistance from the Centers for Disease Control and Prevention (CDC) in investigating reports of the deaths of persons who lived in or visited homes containing imported drywall.

As a result of this request, the CDC investigated the possible connection between drywall and human health concerns. Their findings were able to substantiate claims that the residents of affected homes were subject to irritated and itchy eyes and skin, difficulty breathing, persistent cough, bloody noses, runny noses, recurrent headaches, sinus infection, and asthma attacks (however, deaths were not verified).

Drywall panels are made of a paper liner wrapped around an inner core made primarily from gypsum plaster. Raw gypsum is calcium sulfate hemi-hydrate (for all you chemists) and is a mined material. It can also be manufactured through flue-gas desulfurization while adding calcium (which then produces the hemihydrates). This material is then mixed with fiber (typically paper and/or fiberglass), plasticizer, as well as other materials that increase mildew and/or fire resistance (fiberglass or vermiculite). This is then formed by sandwiching a core of wet gypsum between two sheets of heavy paper or fiberglass mats. When the core sets and is dried in a large drying chamber, the sandwich becomes rigid and strong enough for use as a building material.

Health concerns began, mostly in the Southeast United States, and have been attributed to foreign products, the vast majority coming from China (hence, the term, “Chinese Drywall”), brought into the US during the construction boom between 2004 and 2007. Importation was further spurred by a shortage of American-made drywall due to the rebuilding demand of nine hurricanes that hit Florida from 2004 to 2005, and widespread damage caused along the Gulf Coast by Hurricane Katrina in 2005. An analysis covering drywall imports since January 2006 showed that more than 550 million pounds of Chinese drywall was brought into the United States since then, enough to build 60,000 average-sized homes.

Based on studies by the CDC and other organizations, it has been determined that the concerns from drywall manufactured overseas is due to the off-gassing of hydrogen sulfide. While this gas is known for its toxic effects, it is also a corrosive. It has an odor that resembles rotten eggs, although this odor can be masked. Homeowners alleging that they installed contaminated drywall have reported numerous incidents of corroding copper and other metals in their homes. Corrosion of electrical wiring may hamper the effectiveness of smoke detectors, which presents a safety concern. Low level arcing has also been observed in some homes with Chinese drywall, which could cause an electrical fire.

The Florida Department of Health advised homeowners worried about tainted drywall to check copper tubing coils located in air conditioning and refrigeration units for signs of corrosion caused by hydrogen sulfide, as these are usually the first signs of the issue. Under normal circumstances, copper corrosion appears as a blue/green or dark red color, whereas corrosion as a result of hydrogen sulfide exposure leaves a black ash-like corrosion.

While there are currently few studies exploring the effects of long-term low-level exposure to sulfur gases, short-term exposures can result in sore throat, eye irritation, cough, shortness of breath, chest pain, nausea and death. According to Lawrence Berkley National Laboratories, Chinese drywall can emit hydrogen sulfide up to 100 times greater than non-Chinese produced drywall.

In addition to the presence of hydrogen sulfide in overseas-manufactured drywall, a 2010 laboratory study showed that one hundred percent of affected drywall samples obtained from homes located in the southeastern United States tested positive for the presence of *Thiobacillus ferrooxidans*; an iron and sulfur reducing bacterium. Samples of non-contaminated drywall were found to contain only minuscule levels of this bacterium.

So why does drywall from overseas countries have these problems? As it turns out, these problems appear to stem from the use of fly ash in the drywall, which degrades in the presence of heat and moisture. In an industrial context, fly ash refers to ash produced during combustion of coal and other products. It is called fly ash as it is extremely lightweight and therefore, easily blown away by the slightest breeze. While this material is typically considered a waste byproduct, there are costs associated with typical disposal and transportation. Therefore, industry has been able to collect this material and sell it to other businesses as a stabilizing or solidifying component in such products as Portland cement, roads and drywall. Depending upon the source and makeup of the coal being burned, the components of fly ash vary considerably, but all fly ash includes substantial amounts of silicon dioxide and calcium oxide. Toxic constituents depend upon the specific coal bed makeup, but may include one or more of the following elements or substances in quantities from trace amounts to several percent: arsenic, beryllium, boron, cadmium, chromium, chromium VI, cobalt, lead, manganese, mercury, molybdenum, selenium, strontium, thallium, and vanadium, along with dioxins and PAH compounds. Although United States' drywall uses fly ash, in the US the process has stricter quality standards than many other countries, resulting in a cleaner final product.

If you find that your home has a smell similar to rotten eggs or ammonia or you notice corrosion/pitting of the air conditioner evaporator coils (which are located in the air handler unit) as well as other electrical/copper components, and of course, if you live in the southeast US (although foreign building materials can find their way to other parts of the country), then it might be wise to investigate a little further and contact a dry wall/plaster contractor or electrician to examine the situation. Yes, these professionals do not make house calls for free, but what you spend for their advice may just save you in ways that you could not afford have happen to your house or family.

**If you've got a talent, protect it.**

Jim Carrey