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Gassing the Chinese Drywall Problem

The company that killed anthrax in government buildings says the same solution fixes caustic Chinese drywall.

By: Teresa Burney

The company that used Chlorine dioxide gas to eradicate anthrax from government buildings and mold from hospitals and houses in New Orleans says it can solve the problem of corrosive and stinky Chinese drywall the same way and without removing it.

Sabre Technical Services says it has successfully neutralized the troublesome reduced sulfur gases and killed organisms in Chinese drywall that may be producing the gases in more than a dozen tented houses in Southwest Florida.

“When we treat a house for Chinese drywall, it is fixed,” said Karen Cavanagh, COO and general counsel for the Slingerlands, N.Y.-based Sabre.

Here’s how it works. Chlorine dioxide and reduced sulfur compounds cannot exist together. On contact, the Chlorine dioxide oxidizes the volatile reduced sulfur compounds, effectively deactivating them by turning them into inert sulfate. This isn’t a new phenomenon. Chlorine dioxide has been used for more than 50 years to oxidize reduced sulfur compounds.

Chlorine dioxide gas is also able to permeate a variety of materials, including drywall. During its tests, Sabre said the treatments not only deactivated whatever reduced sulfur gases were in the air, but also sulfur gases that permeate studs, insulation, and other materials in the house.

In the tests on houses in Fort Myers, Fla., Sabre determined the process was effective at reaching the innermost regions of the homes by placing spore strips, biological indicators, within wall cavities, as well as culturing for bacteria, in various locations to evaluate the penetration of Chlorine dioxide into those areas and the drywall itself. After the treatment the spore strips were deactivated and all post-treatment cultures for bacteria of the drywall were negative, confirming the gas penetrated the house and the building materials.

The gas dissipates afterward, leaving no residue, though it does have bleaching effects that require the home’s contents to be removed and stored during the treatment, which typically lasts a day.

Because Chlorine dioxide easily dissipates, it requires finesse as well as generators producing large quantities of the gas to get the concentration levels high enough for long enough in a tented

house to eradicate the sulfur problems. Sabre is the only company with a patent for a Chlorine dioxide generator big enough to handle the task, said Cavanagh.

The process isn't cheap. The going rate now is \$15 to \$20* a square foot. While that may seem high, Cavanagh said that it might still make economic sense if you consider the Chlorine dioxide method can be completed in a few days and leaves the drywall in place versus the current method for dealing with Chinese drywall problems--stripping out and replacing all the drywall in the house, a process that can take weeks or months. In addition, in some cases homeowners return to homes that still smell and blacken copper because the sulfur gases have permeated other parts of the house. Drywall removal costs can also climb much higher if it's required that it be treated like a hazardous material.

"If you go ahead and do all that work and displace homeowners for a couple of months and it still smells, they have a problem," Cavanagh said.

Sabre's scientists are so confident in their method for solving the Chinese drywall problem that the company plans to do something it doesn't often do, market its product to potential customers, including insurers and lenders.

"In the coming weeks we will be much more visible and vocal about what we can do," said Cavanagh. "We can offer a guarantee for life that it won't come back. And that is something we are happy about because the problems associated with Chinese drywall can never come back post treatment. We couldn't make that promise with mold because mold is everywhere."

There are obstacles to overcome if the method is to become a standard for resolving Chinese drywall issues. First, it needs to be accepted by government officials who have not yet made any pronouncements on its effectiveness, though Sabre has kept officials apprised of the results of its research and tests.

Second, insurance companies and others paying for the fix would need to be convinced. Also, there is the possibility that insurance companies could deny claims under various plan exclusions. It's not clear now whether they will pay for drywall replacement either.

Scott Wolfson, spokesman for the Consumer Products Safety Commission (CPSC), which is leading the government's investigation into drywall problems, said he is aware of the Chlorine dioxide solution proposed by Sabre, but did not comment directly on its efficacy.

"It is critically important for the homeowners affected by this issue to know that the CPSC will allow the science to drive the investigation," he said. "The science is being feverishly worked on at this point."

Wolfson said several well known and respected laboratories are studying the contents of the drywall as well as the corroded materials. A team of experts also recently went to China to visit the mines and manufacturing facilities, bringing back samples to be evaluated. Originally, several reports were expected to be completed by the end of September. Now it appears it will be closer to the end of October before they are complete, he said.

** Reflects correction for typographical error in original web posting.*

“The investigation has not slowed, it has just gotten bigger,” Wolfson added.

Cavanagh thinks Sabre has a few things going for it that could help it convince officials and insurance companies that Chlorine dioxide is the best method for solving the drywall problem.

Sabre has made what it thinks is a potentially important discovery during its research and testing of the problem drywall homes. Bacteria that are known to produce these reduced sulfur gases have been consistently found in the problem drywall. If bacteria is causing or contributing to the problem, then any effort to solve the problem will need to address that as well.

“There is a comfort level going into a house that has been treated with Chlorine dioxide,” she said. Relaying the facts that Sabre was hired by the government to use the method for anthrax and that Sabre has treated hospitals with the gas for mold removal “and the patients were moved back three days later” should help ease minds.

“There’s really no question if Chlorine dioxide safety,” she said. “We have treated hundreds of structures without incident or complaint.”

Generating large quantities of Chlorine dioxide and using it as an oxidizer and biocide is Sabre’s specialty. The company got its start in oil fields where it increases yields by pumping Chlorine dioxide into oil wells where it oxidizes clogging sulfur gases and kills organisms that produce them.

After the anthrax attacks in 2001, the U.S. government, aware that Chlorine dioxide gas could kill it without having to destroy the building, called Sabre and asked for the company’s help because it had the only Chlorine dioxide gas generators in the world big enough to treat the buildings. One was in Texas, the other in the Middle East. They were both put on military transport planes and immediately flown to Washington, D.C., said Cavanagh.

Sabre’s big generators can make 250,000 pounds of Chlorine dioxide a day, compared to the 500 pounds a day it takes to purify water in a standard municipal water system.

After the anthrax clean up, Sabre went to New Orleans post Katrina to help sanitize and remove mold from large structures such as hospitals. While there, it treated a few homes for mold as well, even though its system wasn’t meant for such small applications.

But that work allowed the company to perfect methods for smaller building treatments, which it put on the shelf until insurers and builders approached the company about six months ago with the Chinese drywall problem. Sabre has recently tested a method that can treat up to 10 homes at a time in Fort Myers, which could lower costs.

In the process of studying the Chinese drywall problem, Cavanagh says the company has a theory about why there are problems with this drywall that haven’t surfaced before to anyone’s knowledge.

Sulfate naturally occurs in all gypsum, and is, in fact, a component. Until recently, sulfate hasn't presented a problem. The sulfate is inert unless there is some mechanism to convert sulfate to the problem gases. Sabre says its tests have consistently shown that the problem drywall contains bacteria that can produce the reduced sulfur gases that homes are experiencing, including the smell and blackening of copper.

Such bacteria could be present and inactive until a combination of heat and high humidity conditions occur. A theory is that the bacteria in the Chinese drywall could have come from the paper backing that might not have been treated to kill the bacteria. Part of the paper-making process typically involves a step that kills bacteria present in the pulp, said Cavanagh.

"Our data seems to point to the direction that these bacteria are a source," she said.

That might explain why the homeowners didn't complain about smells for a couple of years, why complaints have been more common in hot humid climates, and why they appear to also be more plentiful in homes that were left un-air conditioned for periods of time when the residents were gone.

Sabre's research into the drywall problem also turned up a way to more easily determine if a house has a problem with sulfur gases. It has been using a device called a Dry Filter Unit (DFU) equipped with a copper filter, to suck in and spit out a large quantity of a home's air in a short period of time. The DFU was created to measure particles such as anthrax spores but, equipped with a copper filter, it can mimic six months of problem drywall exposure. Within 24 hours, the copper filter in a home with reduced sulfur gas emissions will be black. If the problem is fixed, it will remain copper colored. The company is developing a small more affordable DFU that can be plugged into a wall like an air freshener.

"It would be nice to see the technology used to solve the Chinese drywall problem," said Cavanagh.

Teresa Burney is a senior editor with Builder and Big Builder magazines.