

April 2009

Monthly Newsletter

This is the fifth installment of our newsletter. Here we discuss Chinese drywall, more business philosophy and a description of the Ascomycetes.

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-E.A. Sobek, Ph.D.

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-Brad Russell, MBA

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-Lyn Pope



Chinese Drywall

By Dr. Sobek

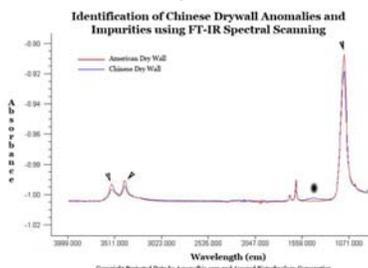
It is estimated that in 2006, enough wall-board was imported from China to build some 50,000 homes of roughly 2,000 square feet each, according to analysis of the shipping records and estimates supplied by the nationwide drywall supplier United States Gypsum. Experts and advocates say many homes may have been built with a mixture of Chinese and domestic drywall, potentially raising the number of affected homes much higher.

The low concentration of impurities in Chinese drywall prevents the use of standard laboratory assays for identification. Only extremely sensitive chemical detectors are capable of discerning Chinese drywall from good drywall.

To meet testing needs of the industry and the many requests of home owners, AssuredBio has teamed with the University of Tennessee to provide the most advanced imaging and chemical detection technologies capable of

identifying Chinese drywall. The

graph in figure 1, provides empirical data of our detection capabilities.



Replicate samples of Chinese and American drywall were analyzed using Fourier Transformed Infrared technology (FTIR). FTIR is a chemically-specific analysis technique. It can be used to identify chemical compounds, and substituents. The x-axis is the wavelength of light and the y-axis is absorbance. The blue line is the spectrum for known Chinese drywall samples and the red line is the spectrum for American drywall samples from Home Depot.

Two discrepancies occur between American and Chinese drywall. The first is the most critical and the reason for rapid corrosion of HVAC metals and wiring. It is represented by the small blue, broad peak around 1440 centimeters on the x-axis.

This is an impurity not found in the American drywall. The second discrepancy is pointed out by the arrows. Notice that in each instance the blue peaks are less than the red peaks. These peaks represent the major compounds that comprise drywall; the Chinese drywall has smaller peaks which likely represents a lesser quality.

We see quality defects in other aspects of Chinese drywall. It crumbles very easy, and has many large air pockets, and a low pH.

The 80/20 Rule

By Brad Russell, MBA

The 80/20 Rule applies to most things in life: friends, hobbies, time, business, and so on. So what is it? In its simplest form the 80/20 Rule states that 80 percent of your outputs come from 20% of your inputs. The ratio varies from situation to situation, but the prin

ciple is the same. A large percent of your results come from a small

percent of the causes.

The base for the 80/20 comes from the turn of the twentieth century when an economist named Pareto discovered that 80% of Italy's income came from 20% of the population. In the 1940s Joseph Juran adapted the idea and called it the 80/20 Rule.

You see the rule all the time. You spend 80% of your time with 20% of your friends. A large portion of your income is spent on a small percent of your bills. 80% of your phone calls are to 20% of the people in your phone book. The 80/20 Rule is everywhere, but it doesn't have to be taken at face value. The more you realize it and use it to your advantage, the better off you will be.

So how does this apply to your business? It applies in many ways. 80% of your revenue comes from 20% of your customers. 20% of your customers take up

80% of your time. Usually those two customer groups do not overlap, leading to some low-maintenance customers producing high revenue and low revenue customers occupying much of your time. Often, the bottom 20% of your customers actually lose you money, so figuring that out and adjusting prices or stopping those projects can immediately increase your bottom line. Determining the 20% that produce the best results and focusing your time on them can be a valuable asset to your business.

The 80/20 rule applies to you in your business as well. If you think about it, 80% of the results you produce each day probably come from 20% of the things you do. If you can determine what things make up that 20% and work to replicate them you can become more efficient and grow your business without additional time and energy. Likewise, if you can determine the 20% of things that cause 80% of your wasted time and money, you can make your business more profitable by doing less.

The bottom line is this: cater to the parts of your business that create the best results and spend less time on those that don't. Only work on projects that are profitable. Your bottom 20% of customers is likely costing you money and understanding that and adjusting pricing or stopping service is in your best interest. Taking care of the 20% that drive your business is also important. Let them know they are valuable to you. In an efficiency-driven world, small things like this can make the difference between winners and losers.

The Kingdom of Fungi: The Ascomycetes :Part 1 of 3

By Lyn Pope

When I began studying indoor air quality, I noticed that fungi were often generically classified into broad categories. This was especially true when looking at the

results from a direct microscopic exam. I began to ask myself "what are these classifications?" In researching this subject, I have learned that by understanding and utilizing the answer to that question can be very helpful when interpreting results from direct examinations. So, what exactly are Ascomycetes, Basidiomycetes, and Zygomycetes?

Starting with the April newsletter, we will begin to take a look into the Kingdom of the Fungi. This kingdom is broken into 5 phyla; three of which are significant in the studies of indoor air quality. Those are: Ascomycota, Basidiomycota, and Zygomycota. We will begin our tour with the phylum of Ascomycota more commonly known as Ascomycetes.

The Ascomycetes include many common fungi that have proven to be problematic indoors. Members of this classification include: *Saccharomyces sp.*, *Aspergillus sp.*, *Candida sp.*, *Neurospora sp.*, *Penicillium sp.*, *Stachybotrys sp.*, *Chaetomium sp.*, *Fusarium sp.*, *Pleospora sp.*, and *Xylaria sp.* Interestingly, this classification also includes many other common types of fungi such as: morels, truffles, brewer's yeast and baker's yeast, Dead Man's Fingers, cup fungi, and the majority of lichens. Ascomycetes like to thrive on dead biomass meaning that they will eat almost anything organic. Inside the home that may consist of wood products, dry-wall, carpet, particle board, sugars, starches, and anything containing glue. As long as the temperature and humidity stay ideal, these fungi will literally eat you out of house and home.

Ascomycetes are unique. They may undergo sexual and asexual reproduction. During the sexual state, Ascomycetes produce their ascospores in a sac like structure which gives many the ability to shoot their spores straight up into the atmosphere. The majority of Ascomycetes asexually reproduce and are often referred to as mitospores. This is because they use mitosis as their reproductive pathway. New spores are produced at the

ends of specialized hyphae called conidiophores and then break off into the atmosphere. These types of Ascomycetes are commonly known as the molds.

Spores from Ascomycetes can be dispersed through several different mechanisms: they can be picked up and moved by the wind through air currents, they can be transported on the fur of animals, they may become airborne by the force of a water droplet, carried around on the soles of our shoes, or shot from their reproductive sac like a gun. Regardless of their mechanism, Ascomycete spores find a way to be around us all of the time.

When analysts perform direct examinations, spores are identified by characteristics which allow them to be assigned to a class. It is the responsibility of laboratory analysts to assign the most specific classification possible when identifying a fungal spore. Molds that are frequently associated with indoor air quality may be easily identified to a genus due to their unique appearance, while others may be painted into a broader classification such as *Penicillium/Aspergillus* or *Acremonium*-like. Molds that are not commonly found in indoor air may be assigned to a more general classification such as that of an Ascomycete or a Hyphomycete. Nonetheless, always be mindful when looking at the concentration of the identified molds on your lab report. All have the ability to be problematic indoors under their optimal conditions.

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