Revolutionary Environmentally Friendly Wood Products in the Building Industry

Part 1: Formaldehyde Free Options

By: Cindy Meehan-Patton, Shelter Ecology, Inc.

Rates of forest growth in the U.S. far exceed the rates of harvest. However the logging of our forests, filling the growing demand for wood in the building industry- are painfully visible. Wood is one of God's truly sustainable resources; the forests were created to regenerate themselves within our lifetime. Wood requires less energy to convert to usable materials than such nonrenewable resources as aluminum, steel, concrete, and plastics. However, if energy availability were not a problem in the future, then global use of these nonrenewable resources would increase if their cost structures allow competitive pricing. However, because energy availability is slowly but surely becoming constrained, wood and other renewable resources are likely to become relatively more valuable.

In turn, it is relevantly important to focus on decreasing our dependence on fossil fuel and nonrenewable resources of energy and instead more on those that are renewable, but in a non-threatening or "sustainable" way. If our society were to comply with this statement we would design and build smaller, more efficient homes that are built in such a way to outlast us and that consume less nonrenewable energy in more efficient ways. This is a mouthful and a challenge given all the immediate, inexpensive resources we have at our fingertips to construct homes so that they cost less overall but perform inefficiently and become toxic mold traps within a few years or even months of inhabiting!

Most wood is engineered (or combined with chemically derived adhesives and binders for strengthening the use and ply of the material) in some way for the construction industry. Formaldehyde used in Plywood, OSB or Oriented Strand Board and Glue Laminated Support Beams are just a few examples. The focus of this article is to introduce some products that are available to us which offer alternative means for the adhesives and binders thus eliminating chemical toxins from the engineering process. These products are widely available to the building and retail industry throughout the U.S.

Plywood, a material used in almost every construction project, will be the first focus. Plywood is actually plys of wood that are glued together with toxic urea formaldehyde based glues. In 2005, Columbia Forest Products (CFP), one of the nations largest manufacturer and supplier of wood products for building succeeded in launching a revolutionary soy based and amino acid adhesive which will take the place of the formaldehyde based glues. This product has been in the works for over 10 years. By 2006 (this year), supposedly all four CFP plants will convert to using this adhesive. Their plywood products are then sold to distributors all over the U.S.

PureBond formaldehyde free hardwood plywood is one of CFP's products. Not only is this plywood formaldehyde free, but it is also made from FSC (Forest Stewardship Council) certified wood. This means in a nutshell, that the wood contents come from strictly sustainably harvested forests, where the entire eco-system is less jeopardized. CFP also offers a agri-fiber core (or wheatstraw) PureBond product with the formaldehyde free binder, for those of you who want to use a completely renewable fiber other than wood. They are offering other FSC certified wood products now including I joists and glue-laminated beams. However, these products still contain formaldehyde-based adhesives.

AFM Safecoat Safe Seal is yet another option if the formaldehyde based plywood has already been installed. Safe Seal is water based, not toxic, sealant that can be used to "lock in" the formaldehyde found in plywood products, preventing it from outgassing.

This is good news. If you do not see these products in your local lumberyard or stores, then inquire for them. They are available, but their success will rely on supply and demand, like any other product in the industry. It is up to us as consumers, to create this demand.

Websites: www.columbiaforestproducts.com • www.afmsafecoat.com

Part 2: Sustainability and Wood

Building materials derived from our natural world were created as a tool for us to survive. God gave humanity, his most prized creation, dominion over all things of the earth so that we might take care of them, and in turn they nurture us. Wood is the most used and abused material in the buiding industry. It not only provides the envelope of our buildings, but it keeps us warm (along with numerous other uses!). Wood is meant to be a sustainable resource; forests were designed to regenerate themselves within our lifetime. Mankind's demise however, has been to poison and destroy our forests, in some cases and areas, faster than they can be regenerated. Because our natural resources are becoming constrained, wood is increasing in value, and becoming more expensive. This throws a kink in the building industry, increasing the cost of building. The Certification for "sustainable approaches to forestry" are also expensive. So it all adds up.

Yet, it is vitally important to decrease our dependence on fossil fuels and nonrenewable resources of energy and instead more on those that are renewable, but in a non-threatening or "sustainable" way. The focus of this article is to introduce products and ways that wood is being used in more sustainable ways in the building industry. A minimal definition of sustainability in relation to the building industry is: "Don't build at all." Applying this definition to sustaining our wood forests would state: "Don't use wood at all."

Have you seen a house constructed without the use of wood? It is a rarity. A couple of natural grass derived materials are hitting the American market, and have been around for quite some time, used by countries that do not rely on a manufacturing industry to provide their materials; they rely on the land around them. Ancient cultures for example, have always relied on grass, mud, cob, bamboo and straw as their materials. Bamboo and wheatstraw are both being engineered, made into panels and flooring mainly for interior use in the U.S. Natural building techniques are also becoming more popular in the U.S. but should be scrutinized as an appropriate method in mixed and high humid climates like Western North Carolina.

Another definition of sustainability states: "Built environments that preserve and create safety of our natural resources for generations to come." This is where sustainable harvesting of wood must come into play. Raping and logging our forests can simply change to selectively cutting and preserving the ecosystem of our forest. It is that easy and that hard of a change. But vital it is to the health of our earth and the people in it. That simply cannot be argued!

Sustainably harvested wood sources are available in two ways; certified and non-certified.

Certification is made available through FSC (Forest Stewardship Council), which sets international standards for responsible forest management and accredits independent third party organizations who can certify forest managers and forest product producers to their list of standards. Its trademark provides international recognition to organizations who support the growth of responsible forest management. There are two types of FSC certificates available. Certification provides written proof and it also gives manufacturers eligibility to label their products with the FSC logo. Columbia Forest Products, one of the largest wood manufacturers in the US, has an extensive line of certified products. (www.columbiaforestproducts.com)

Non certified sustainably harvested wood sources include plantation grown forests that are selectively cutting and milling for construction use. These are usually pretty small, often "mom and pop" lumberyards often offering more personalized service and architecturally interesting wood products. There are also a handful of building companies that selectively cut and harvest trees directly from the construction site and reuse the wood in the building process. This method has actually been going on for many years and frankly gets my vote as the most sustainable approach to today's culture. Why? Since wood is the most used material in building, this means that it relies heavily on transportation, which creates pollution and continued addiction to fossil fuels to get us what we need. Using trees from your own land to build with reduces that culprit. It can also save some money in the process, depending on the planing and machining process that is needed for a given tree to be made into your kitchen floor!

The fact of the matter is that sustainability is a worldwide concern which trickles down to our individual efforts to create buildings that do minimal damage to our God given environment.

Cindy Meehan-Patton, President of Shelter Ecology, Inc. is also a founder of the non-profit WNCGBC. Contact the council for more information on green building or becoming a member.

Part 3: Treated Wood

Poisonous man made chemicals that are added to one of our most treasured natural resources, wood, has created a set up for both problems and solutions to our world. Auto Immune system diseases are on the rise and one of the culprits is environmentally based poisons. It is close to impossible to walk into a building that does not have some plethora of toxins floating around in the air. We breathe that air, and it is a fact that these poisons are making many of us sick. I know first hand. On the other hand, treating wood to preserve it gives it longevity and increased rot and insect resistance when it is exposed to the outdoor elements.

So let's look at some safe options for treated wood that are somewhat new to the market. Pine, a relatively inexpensive wood, is the most commonly pressure treated wood in the industry. Thankfully, CCA (Copper Chromium Arsenate) is being phased out of the pressure treated lumber industry. A "less" toxic concoction is being used in it's place: ACQ (Ammonium Copper Quat). Quat is a swimming pool preservative that is supposedly safe for human consumption. ACQ still contains copper, which like arsenic is very toxic to human and animal consumption. (www.acq.com) ACQ lumber has essentially taken the place of CCA treated pine for decking and other building and outdoor wood products.

On a more natural note, there is a 100% non toxic (to animals, humans and soil) mineral salt which acts as a wood preservative- known as LifeTime Wood Treatment. Made in Canada and used for over 60 years in their building industry, this product is slowly being brought into the limelight of the building industry here in the states. Unlike other wood treatments mentioned in this article, LifeTime can be applied by the consumer and is easy to ship because it is a simple little bag of salts (that is mixed with water). The one drawback is that it naturally patinas the wood it is applied to, making it look aged. This accelerated patina process actually gives the wood better UV protection over time. (www.valhalco.com)

Borates, a renewable mineral, have long been used to deter termites and other boring insects from wood. While they can be toxic to some organisms, they are still safer than copper and arsenate used in most pressure treated woods. Louisiana Pacific (LP), a huge manufacturer and supplier of wood products for construction offers some revolutionary engineered wood products that are treated with Borate's. Their SmartGaurd line includes an affordable siding and exterior trim OSB product that is paint grade and offers a 30 year termite resistance guarantee. LP also offers OSB roof, wall and subfloor sheathing which offers a 20 years termite resistance warranty. This product does contain formalde-hyde-based glues, but will hopefully switch over to the formaldehyde free glue that I described in part 1 of this series on wood. (www.louisianapacific.com)

Timber Treatment Technologies, LLC (TTT) has introduced TimberSIL which relies on an inorganic mineraliza-tion process (rather than a toxicity process) for treating wood. TTT's process actually makes the wood unrecognizable as a food source. The ingredient: sodium silicate or water glass. It is a non edible, non- offgassing mineral. The CEO of TTT was driven to this invention through the huge increase in autism and it's exposed link to heavy metal poisoning. Sodium Silicate has been around for a long time with one of it's uses being a flame retardant for wood products. But as the mineral was found to be water soluable (like Borates) along with the fact that it formed an unattractive white dust on the wood, it had to be further developed as a treatment method for wood, thus resulting in TimberSIL. Another benefit to this product is that it takes to paint and stain well. Since it's introduction, TimberSIL has won "product of the year" awards with trade magazines and has been signed under Huttig Building Products, one of the largest domestic distributors of wood products and millwork materials, with 46 distribution centers serving 47 states. (www.timbersil.com)

Less toxic options for our treated wood, an important industry, are available. Your smaller lumber yards and hardware suppliers are more likely to either carry these products, or are at least able to order them for you. This gives you the opportunity to support your smaller local businesses, which is needed in a world taken over by big corporations and mergers.

Green Building in It's Simplest Form

By Cindy Meehan-Patton

Defining Green Building should be simplified so everyone can understand the general meaning of this important profession. I have been in the field of green design for over 15 years and this is what it encompasses to me: " Building Healthier for You and the Environment".

It is that simple, and like many things in life, it is that complex. As an individual with health challenges resulting from toxic chemically derived building materials and toxic mold in structures, I can only speak from the standpoint of what I know really works to alleviate this common problem in our homes.

I am not alone in this challenge. According to the Mayo Clinic, recent studies have linked mold to a 300% increase of Asthma rates over the past 20 years. I have helped many folks eliminate the chemical toxins from their environments- simply so they could stay alive and well.

Building healthier can involve different methods and materials for different people. Two of the more popular methods involve a reliance on the sun (solar) and natural materials like wood for heating creates a healthier environment for their families and the environment. Some think that creating and maintaining clean indoor air quality is our best chance for staying healthy in an unhealthy environment. These are both good ways to build. And both ways can take advantage of the many new materials that are being made today that are more respectful of the environment and people's health. This is good news.

There are, however, some facts about our climate here in Western North Carolina that can influence both of these building methods. We are in a mixed-humid climate zone according to the EPA and EEBA (Energy and Environment Building Association). This means that for over 200 days out of 365; we have outdoor humidity levels between 75 – 100%. The recipe of high humidity and reliance on natural ventilation (opening of windows) in homes creates toxic mold indoors.

Given this fact, green building should have an end result of keeping the home dry inside and out. Moisture migrates indoors in several ways and moist air, unlike arid air, finds the first porous surface it can and it makes a home- and then it grows and moves. This is where visible mold comes into play, especially if the humidity is constantly above 60%, inside and out.

Can an active solar home have an end result of staying dry, inside and out? It takes so much electrical energy to run a mechanical ventilation system that a PV (Photovoltaic) system cannot handle the load. This is a complaint I hear often from people who are building solar or who have built solar and are now faced with mold because of their reliance on natural ventilation for cooling. We need to find a not- toxic, affordable solution to this problem along with a lowering of the cost of PV panels (tax credits do help) in order for solar building to become more affordable and healthy.

I believe the best way to ensure a healthy built home or green home is to build it tight and ventilate it right. The other essential ingredient to this recipe is to use not-toxic materials on the inside of the home. There are many mechanical ventilation systems on the market now including ERV's (Energy Recovery Units) and HRV's (Heat Recovery Units). Both types exhaust stale air and bring controlled amounts of fresh (and filtered) air in. Neither have the dehumidification capacity needed in a mixed humid climate. There is another system that brings a controlled amount of fresh air in, filters it and acts as a whole house dehumidifier, but leaves out the exhaust part of the equation. This seems to work well in this area, because you end up with a positive pressure in your home at all times. According to Building Science Corporation, even the tightest home will have weep holes in it and when a house has a constant positive pressure in it; that stale air will find it's way out.

Biblically, mold is a curse brought upon people. God created us as living, organic people. He also created the beautiful world we live in to sustain us. According to the Bible, God created man and gave us His own breath, and put us into the world God created for us. In the worlds simplest form, the sustenance we drew from consisted of water, air, plants and animals. There is no mention of toxins in the beginning. This is part of our separation, thus creating illness. God appointed us to take care of His creation, not to harm it. It is amazing that our Creator still loves us regardless, and that in an instant, He can fix what has been harmed by His most precious creation, people!

Cindy Meehan-Patton is one of the founders of the non-profit WNCGBC. Contact the council for more information on green building or becoming a member. www.wncgbc.org 828-232-5080 info@wncgbc.org