

Hardwood Review *express*

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Market Opportunity: Heat-treated Hardwoods

European Technology has Chance to Grow

A subscriber recently requested that we recap what has happened to markets for hardwood lumber during the past several years. Simply put, most markets have shrunk significantly in the past two years because of extremely slow home building activity. Cabinet, flooring and moulding/millwork manufacturers will eventually begin buying again, although it is unlikely we'll see purchase volumes come close to the housing boom years of 2004-2006 for some time. Furniture manufacturing has changed much more than other markets with significant production transferred overseas, locking out many sellers without developed exporting programs. Despite numerous predictions and even some news stories about the return of the furniture industry to the United States, the reality is that lumber sales to furniture makers may never be what they once were.

Looking back at the reasons for these changes could be a useful learning exercise, but will do little to improve upon the future. Instead of reflecting on what went wrong, let's take some time to look at the opportunities that may be emerging. There are other markets out there besides cabinets, flooring and millwork/moulding. New markets might not need the same type of lumber sawmills are used to supplying, but they will require plenty of wood. We've looked at some emerging markets in the past few years, such as wood pellets and cellulosic ethanol, and there are others that are just starting to surface. While everyone is fighting to hold on to their slice of a shrinking lumber pie, new markets open up opportunities to make the whole pie grow.

Heat-treated Hardwoods
Sometimes referred to as toast-

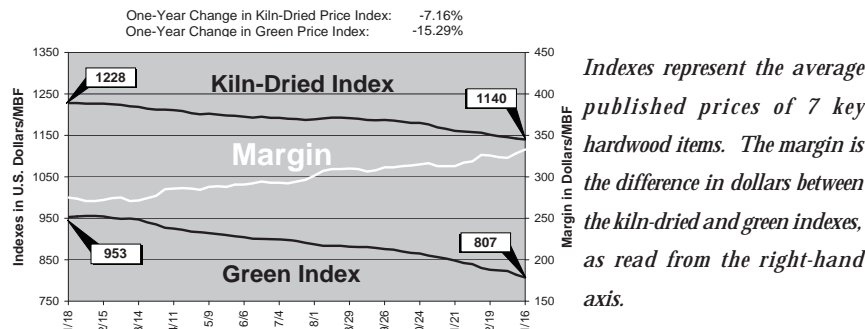
ing, roasting or cooking, heat treating hardwoods is a market with untapped potential. A few years back, Westwood Timber Group was handing out samples of heat-treated Birch at IWF. We've had a sample sitting around the office ever since, but heat-treated wood seemed

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like a novelty item until a few weeks ago when the topic came up with a couple of our Canadian readers.

The basic process to heat treat lumber is to cook it in a low oxygen environment at around 390 degrees Fahrenheit (200 degrees Celsius) for several hours. Pressure and chemicals are not used, just heat and steam. Traditionally, the heat has been created with oil, but some plants in Europe now use wood byproducts. Steam is used to keep the wood from burning. After the lumber is heated for the required amount of time, it is cooled slowly to prevent quality problems.

Heat treating lumber causes a number of chemical reactions that change the appearance and structural properties of the wood:

- Lumber becomes darker in color, changing to a brown or dark brown.
- Lumber absorbs less moisture, so it becomes more dimensionally stable.
- Heat conductivity is reduced.
- Lumber becomes more resistant to rot and decay.
- Lumber becomes lighter weight (due to moisture loss).
- The wood weakens and becomes less bendable.

The darker color caused by heat treating can be an advantage when fashions run toward darker woods, as they have been recently. Conversely, heat-treated woods could fall out of favor in some applications simply because they cannot be manufactured in light colors. The darkening allows light colored species such as Aspen to mimic the darker, richer browns of higher valued species such as Walnut.

The heat treating process can reduce the amount of moisture wood absorbs by 50%, which in turn can reduce shrinking and swelling by 50 to 90%. Less moisture in the wood, combined with some of the chemical changes that take place at high heat have proven to make heat-treated wood much less likely to rot than the same non-treated species. For North American hardwoods, this opens up a number of new applications that have generally been limited to pressure-treated softwoods or tropical hardwoods in the past. In some cases, it also opens the door for growth in markets that have been dominated by non-wood products due to moisture and rot concerns. For most hardwood applications, the up to 30% decrease in bending strength that accompanies heat treating is not a serious impediment to its use.

Although the market is still small, sales of heat-treated lumber in Europe have grown 286% since 2001, according to the International ThermoWood Association (Figure 1). A substantial part of this growth was spurred by the 2004 banning of chemically preserved wood in the European Union (EU) for environmental reasons. Approximately

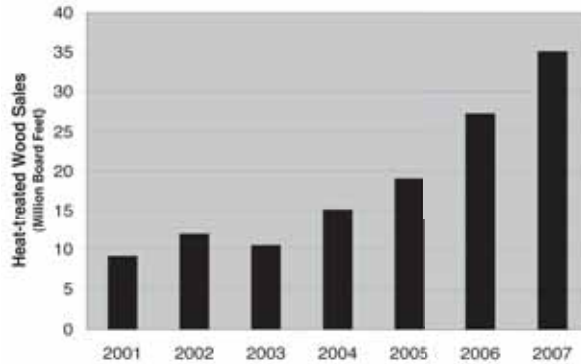


Figure 1. Sales of heat treated lumber in Europe (International ThermoWood Association).

2.8 million board feet of heat-treated hardwoods were sold in the EU in 2007, accounting for about 8% of total heat-treated lumber sales.

Opportunities for Wood Products Manufacturers

Heat-treated wood's improved moisture resistance and dimensional stability make it an excellent option for wood flooring in spaces that solid wood flooring traditionally has been ruled out. Engineered wood floors have been substituted in many of these areas. Strip or plank flooring made from heat-treated lumber may be the solution to growing the available market for solid wood flooring.

Furniture manufacturers have the opportunity to jump into the market for wooden outdoor furnishings by offering it at much lower prices than Teak or Ipé furniture. Several industry studies over the years show that wood is often the preferred type of outdoor furniture among North American buyers, but they settle for metal or plastic alternatives due to wood's high cost. Heat-treated furniture could be made from lower-cost species, such as Aspen, Birch, Beech, Poplar and others. This lower-priced furniture might not take market share from Teak, but it could win significant market share from metal and maybe even plastic furniture.

Heat-treated hardwoods also provide the opportunity to produce more specialized wood products for those consumers looking for something unique in their homes. Search the Internet and you'll find some unusual uses for heat-treated wood, such as replacing tile on a shower floor. In Europe, heat-treated wood has been commonly used in spas for sauna benches because of its durability and low heat transfer, so some imaginative uses in very wet spaces are possible.

According to the North American Deck and Railing Association (NADRA), nearly 85% of homes in the United States have a deck, balcony or patio. In addition to often being included in new construction, decks are a common



remodeling project. NADRA also estimates that 20 million decks are in need of rebuilding or repair. Composite decking products have captured approximately 14% of the decking market, according to The Freedonia Group. Most decks in North America are made from treated softwoods or Cedar, but hardwoods have been sneaking into the market. Ipé is now popular as a high-end decking material because it requires less maintenance than softwood decking. Heat-treated North American Ash has the potential to be a lower-cost substitute for Ipé in outdoor living areas.

In 2004, the United States restricted use of chromated copper arsenate-treated softwood lumber for children's playgrounds, finishing materials for waterfront homes, and in pallets used to transport food. Concerns over possible health risks of the chemical treatment have left few alternatives for these markets. Although most playground equipment would probably be better served by using heat-treated softwoods for their strength advantages, there may also be room for hardwoods in some applications. In addition, heat-treated hardwoods would be excellent decking choices for those building on waterfront properties.

Opportunities for Lumber Sellers

Growth in the demand for heat-treated hardwoods in the U.S. and Canada could provide a number of new opportunities for sawmills and other lumber sellers. Heat treating plants would most likely purchase kiln dried lumber because ideal moisture content before the heat treatment process is lower than 10%. Lumber used in heat treating can include sound knots, as long as this is aesthetically suitable to the end-use, so a handful of grades similar to those used in flooring sales might be developed.

Lumber companies with suitable capital may consider investing in the heat treating technology. There are few plants capable of heat treating in North America right now, which provides those early adopters with an advantage, but also with the burden of helping create a market for heat-treated lumber.

One of the best aspects of the heat treating process is that it provides a potentially profitable market for species which are generally not very profitable. Ash, Aspen, Beech, Birch and Poplar are among the species most commonly heat-treated. Oak is also receiving growing attention due to its declining price.

Lumber sellers don't necessarily need to wait until heat-treated wood products catch on in North America to benefit from growth in the industry. Europe has numerous heat treating plants, at least a few of which have purchased North American lumber in the past. Europe's use of heat treating continues to grow and there are indications that Asian manufacturers are more interested in

heat-treated hardwoods to replace dwindling supplies of tropical hardwoods.

The Green Connection

Heat treating plants do emit natural chemical compounds from the wood and would require permitting similar to what is needed for dry kilns. While increased emissions will draw scorn among a certain segment of the population, the end product promises to be easier to sell in the "green" conscious society in which we now live. A life cycle analysis conducted in Europe found that heat-treated lumber had about the same impact on the environment as chemically treated lumber, primarily because the heat treating process uses a great deal of energy. However, heat-treated lumber can easily be sold to the public as greener than chemically treated lumber because of the lack of chemicals. Simple "chemical free" labeling would be enough to set it apart from treated lumber. As with traditional hardwood lumber, heat-treated lumber can be differentiated in the marketplace from the stigma of tropical deforestation and softwood clear cutting.

The Challenge

The challenge comes in marketing heat-treated hardwoods as a viable solution. The same consumer perceptions that should help sell heat-treated products will work against them catching on. For instance, everyone "knows" that wood floors in the bathroom are not ideal. Everyone "knows" that you use chemically treated softwoods to build a deck. People are creatures of habit and breaking them of old patterns of thinking is a challenge. It will require a significant marketing effort to change the old patterns, but it can be done. We've witnessed large shifts of thinking, such as Oak being out of fashion and painted mouldings replacing stained mouldings. If these things can happen and heat-treated lumber is as good a product as advertised, then opportunities are there for companies that are willing and able to pursue new and exciting business opportunities.

