Treatment Fights Rot With Heat, Not Chemicals

If you've been to any building trade shows recently, you may have run across a new decking product dubbed PureWood, marketed and supplied by Memphis, Tenn.–based Bay Tree Technologies. What makes this southern yellow pine decking unusual is that it resists rot without the help of added chemicals. Instead, a patented method (the Stellac Process) changes the wood's chemistry with heat and steam, making the wood less susceptible to decay — enough that the company is willing to extend a 25-year warranty against structural damage from rot, warps, checks, corrosion, or insects.

The concept to use heat to preserve wood isn't new — the archaeological record shows that Native Americans, Greeks, and Koreans, among others, charred the bottoms of wood posts to protect them from rotting — but it wasn't until the 1990s that it was applied on a production-level scale. First developed in Finland, the manufacturing technology for what is called "thermal modification" has since spread to Europe, Asia, Canada, and the United States.

The process, which takes about 24 hours per inch of thickness for wood that has already been kiln dried, involves heating wood in several stages in large airtight kilns. First the wood is dried to zero-percent moisture content at 212°F. Then the temperature is raised to at least 374°F (in PureWood's case, as high as 482°F); this phase is when significant chemical changes occur. To finish up, moisture is reintroduced to the wood, resulting in moisture content from 4 percent to 7 percent.

Thermally modified wood is being produced for decking, not as a replacement for pressure-treated framing.

Due to these chemical changes, thermally modified wood can't absorb moisture easily, so it doesn't shrink and swell as much with changes in humidity as unmodified wood does. This improvement in dimensional stability means the gaps between boards won't change appreciably after installation. Exposed cut ends should still be sealed, however, to prevent checking.

Another benefit to the wood's consistently low moisture content is that the growth of rot-causing fungi, which prefer moisture content of 20 percent or higher, is discouraged. And because the thermal modification process also causes wood sugars to be converted to a less palatable substance, fungus and mold are deprived of a food source as well.

The most visible effect of thermal modification is that the wood is uniformly darker. Bay Tree Technologies recommends applying a UV-inhibitor to PureWood to preserve the warm cocoa color, or the wood will turn gray over time. The wood can also be sanded and painted, if desired. The low moisture content of the wood, though, means it behaves more like hardwood — its sawdust is fine instead of coarse like that of unmodified SYP — so it's essential to use eye and breathing protection when sanding or cutting it, advises Mark Gagnon of Bay Tree Technologies.

Thermally modified wood is being produced only for decking, not as a replacement for pressure-treated framing. According to the VTT Technical Research Centre of Finland, thermally modified wood is "not recommended for use in load-bearing constructions," because there is some question whether bending strength is compromised at higher temperatures. Dallin Brooks, a research coordinator at TekmaHeat (a Canadian company that builds

thermal modification equipment), explains, "At temperatures around 230°C [440°F] the cellulose begins to crystallize and this decreases the bending strength and modulus of elasticity (MOE) significantly." But the technology keeps improving and companies are getting better results at lower temperatures; currently, says Brooks, the Finnish ThermoWood Association "does not recommend temperatures above 225°C [437°F] and has established its guidelines for stability at 190°C [374°F] and durability 210°C [410°F]" — which is below the temperature at which testing shows structural weakening.

So what's to prevent its use as framing material? According to Brooks, the main barrier to applying thermal modification to larger structural components, such as beams and joists, is the cost, which simply isn't competitive with that of standard pressure-treated lumber. The price of PureWood, for example, is comparable to high-end composites and cedar and redwood, says Bay Tree.

PureWood (www.purewoodproducts.com) is produced in Terre Haute, Ind., and is available in the Southeast U.S. Boards are 1¼ inches thick and 5 inches wide, in even lengths from 8 feet to 20 feet. Bay Tree recommends predrilling holes for fasteners, using a carbide-tipped saw blade with 40 teeth or more for cutting the wood, and spacing joists 16-inches on center. The wood itself is not corrosive to standard exterior fasteners, says Bay Tree, but if it is being fastened to PT framing, then the appropriate fasteners need to be used. — *Laurie Elden*

What's in a name? Now that Alcoa Home Exteriors is no longer marketing Oasis decking and railing, Deceuninck — the manufacturer of Oasis — is rebranding the Oasis product line as Kodiak Decking and Railing (www.kodiakbuildingproducts.com). The change is in name only, however; the product itself remains the same. Vinyl fencing, porch posts, and post covers are also available in the Kodiak brand.

Given the abysmal performance of the housing industry in 2007, it's not surprising that the deck, fence, and rail industry suffered, too. In its publication "The U.S. Market for Fence, Deck and Rail Products," SBI, a market research firm based in Rockville, Md., reports that sales were down 16 percent in 2007. SBI predicts in the report that 2008 will be another slow year, but sales will rebound in 2009, with 4 percent growth. Then better times are forecast through 2012, with 7 percent to 9 percent growth.

Cabot Stains has recalled Composite Deck Cleaner Number 3502, after receiving "one report that a container of the Deck Cleaner partially melted and emitted chlorine gas." According to the Newburyport, Mass., company, consumers who have the product should return it to the store of purchase for a full refund. But if the container is misshaped or hot to the touch, the company says consumers should "immediately call 877/755-3336 toll free, 24 hours a day, 7 days a week, and a representative will arrange for safe handling of the product."

APA-The Engineered Wood Association has released a product advisory warning builders not to use scaffold planks that don't have the seal of a recognized certification agency. According to the advisory, APA tested a limited number of uncertified LVL scaffold planks imported from China that were marked "2.2E proof tested OSHA," which implied the planks met OSHA standards. The test results, however, showed that the planks' bending stiffness and strength were significantly lower than what the label on the planks claimed. The complete advisory is available at www.apawood.org.

Code changes can be tough to keep up with, and in the last year there have been a number of changes to the International Residential Code that apply to deck building. To see them, you can download the 2007 Supplement to the IRC at www.iccsafe.org/cs/codes/2007-08cycle/2007Supplement/IRC07S.pdf. The price is right — free — and the pages dealing with the new ledger details can be found in Chapter 5, "Floors," on pages IRC-34 through IRC-36.

2008 Shows & Events

May 31–September 28
Totally Terrific Treehouses
Tyler Arboretum
Media, Penn.
610/566-9134
www.tylerarboretum.org

June 11–13
Southern Building Show
Home Builders Association of Georgia and Greater Atlanta Home Builders Association
Atlanta
800/854-7736
www.southernbuildingshow.com

June 24–27
PCBC 2008
California Building Industry Association
San Francisco
800/956-7469
www.pcbc2008.com

July 30–August 2
Southeast Building Conference
Florida Home Builders Association
Orlando, Fla.
800/261-9447
www.sebcshow.com

September 9–12
Remodeling Show
Hanley Wood Exhibitions*
Baltimore
972/536-6461
www.theremodelingshow.com

September 14–23
2008 Annual Conference and Final Action Hearings
International Code Council
Minneapolis
888/422-7233
www.iccsafe.org

October 7–10
JLC Live Midwest
Hanley Wood Exhibitions*
Minneapolis
800/261-7769
www.jlclive.com

November 15–20
International Pool | Spa | Patio Expo
Hanley Wood Exhibitions*
Las Vegas
888/869-8522
www.poolspapatio.com

*Hanley Wood Exhibitions is owned by Hanley Wood, which also owns Professional Deck Builder.