Thermally Modified Decking

It's heat-treated to be rot-resistant and dimensionally stable, but how does it actually perform?

by Charles Wardell

Thermally modified wood, also called heat-treated wood, has been available since the mid-1990s in Europe, where it was developed as an environmentally friendly alternative to tropical hardwoods. It's relatively new to North America, though, and its lack of a track record makes a lot of builders hesitant to try it. With that in mind, we decided to take a closer look at the material and talk with some professionals who do have experience using it.

The material consists of wood made decay-resistant without chemicals being added. The three main North American distributors are Weston Premium Woods, in Brampton, Ontario; Thermory USA, in Wilmette, Ill.; and EcoVantage, in St. Joe, Ind. While some of the North American supply comes from Europe—Thermory gets most of its wood from a plant in Estonia—there are plants operating in Georgia, Pennsylvania, New Hampshire, and Indiana.

Thermal wood has a variety of uses. Carlyle Holman, EcoVantage's head of sales, says that his company has fulfilled custom orders for more than 100 differ-

PHOTO: ROSARIO UNGARO

Heat-treated northern ash arrives on the jobsite with a brown color, but will turn silver gray just a short time after installation if not protected with an oil-based UV-protectant finish.

Heat-treated southern yellow pine is also available. The manufacturer recommends coating the decking with Seal It Green Xtreme to help preserve the decking's golden brown color.

ent wood species, for uses that range from bird calls to guitars to gun stocks. The biggest-selling species—and the only ones stocked by dealers in the U.S. and Canada—are northern ash and southern yellow pine, for decking and siding.

The decking is sold and priced as a premium product. The suppliers and deck builders we spoke with say that thermally treated ash costs as much as or a bit more than ipe, depending on the market. Southern yellow pine is priced on par with cedar.

How It's Made

The heat-treating process consists of placing wood in a kiln, slowly raising the temperature to 400°F or more, and holding it there for several hours. Because the temperatures in the kiln exceed the wood's combustion temperature, air is evacuated and replaced with steam. The steam has another benefit. "Wood becomes brittle when the outside dries faster than the inside," says Francis James, a Thermory product specialist with Weston Premium Woods. The steam helps the wood dry evenly, keeping it from getting brittle.

The heat and steam cook out sugars and resins, leaving no food source for bacteria and mold. "We cook all the sap and resin out of the wood, so there's no nutritional value," says Igor Danchenko, founder and president of the Westwood Timber Group, which owns a kiln in Macon, Ga. Warranties against rot and decay range from 20 to 30 years.

Danchenko explains that the process alters the wood's cell structure, making it moisture-resistant and dimensionally stable. "If you put a piece of this in a bucket of water for a week along with a piece of nontreated wood, the heat-treated product will absorb five times less water. Expansion and contraction is five to 10 times less than nontreated."

Although it swells slightly when first wetted, it doesn't re-shrink, according to Holman. A 5 1/2-inch deck board will swell about 1/16 inch and stay that way. "It's because of the way we cook the resins and sugars out of the wood," he says. Gapping southern yellow pine 1/8 inch will leave a permanent 1/16-inch gap after it swells. Ash exhibits no discernible swelling.

The wood does weaken somewhat during the process. "There is a strength reduction of 25% for southern yellow pine, but you can still install deck boards over 16-inch-on-center framing," says Dave Bartnik, president of DeckMasters of Canada, a lumberyard dedicated to deck builders. Treated ash retains enough strength that it can be end-matched, which means that deck boards can meet between a joist, a feature that Francis James says reduces waste by about 5%.

Hardness is not affected by the treatment, according to James: Thermally modified ash has the same Janka resistance rating as regular ash.

Pros and Cons

To be happy with this product, it's important to adjust your expectations about weathering. Bartnik finds that it grays dramatically faster than any other wood. "The heat-treated southern yellow pine starts out a golden brown and the ash a dark chocolate brown, but they both turn color within three months."

For some this is a deal breaker. "It's true that all wood turns gray eventually," says Mike McKay, a Wasaga Beach, Ontario, deck and dock builder who built a 750-square-foot deck from heat-treated southern yellow pine three years ago. "But if I'm spending that kind of money on a deck product, I want it to look good for a long time." McKay reports that the

PHOTOS: LEFT, THERMORY; RIGHT, ECOVANTAGE

These deck boards are being treated with an oil-based coating. Water-based products can't be used because heat-treated wood doesn't absorb water.

While heat-treated wood quickly turns gray, it can be pressure-washed and re-treated to restore color. This deck was restored after a year in the sun.

decking he purchased wasn't prefinished or sealed, which he suspects may have contributed to its rapid weathering (he applied an oil finish to the deck after installation). Most thermally modified decking is now prefinished and sealed prior to delivery.

According to McKay, the surface weathering didn't impact the structural integrity of the decking; in fact, the boards showed no signs of decay, checking, or movement. But after being pressure-washed, sanded, and refinished, the boards quickly turned gray again.

For other contractors, the color change is a nonissue. One of these is Jim Smith, project manager with Mark Tanner Construction, in Truckee, Calif., who has built 20 decks with the Thermory product. Truckee's 6,000-foot elevation in the Sierra Nevada mountains puts all materials under severe UV exposure. "It doesn't matter what you use," he says. "The UV here is so strong that everything grays."

One solution is proper field treatment with an oil-based preservative. It must be oil-based because the wood doesn't absorb water. Smith uses Cutek Extreme, a high-performance wood protector with a UV inhibitor that's imported from Australia (cutek.com.au). It forestalls graying for up to a year, after which the boards can be pressure-washed and re-treated. EcoVantage's Holman recommends a product called Seal It Green Xtreme, a stain/sealer specially formulated for thermally treated wood (sealitgreen.com). He says that a tint can be added that will extend the color life on decking for as long as three years.

Smith finds that the material holds up well to temperature swings. "In the spring, temperatures can range from 15°F in the morning to almost 90°F during the day," he says. "Other decking products can expand and contract up to ¾ inch with these temperature swings, but Thermory doesn't move at all."

One reason Smith prefers the ash product is because of its hardness. "When we have heavy snow years, products like ipe and synthetic decking get nicked and scratched by the snow removal process," adds Smith. "Thermory ash stands up a lot better."

Workability

Other contractors mention the same benefits that Weston Premium Woods' James does. For instance, Toronto deck builder Rosario Ungaro used Thermory on a porch two years ago. Like a lot of builders, he was hesitant at first. "I saw it at the International Builders Show in Las Vegas," he recalls. "I was skeptical, but our client wanted to try it out." It turned out to be a good decision. He recently returned to inspect the porch and immediately noticed that none of the boards had moved. "With most woods, the miter joints would have started to separate, but we didn't see any of that," he says.

He says the material was a pleasure to use. "You do have to pre-drill before fastening, but it's generally great to work with when compared with an exotic wood like ipe," he says. "Cutting is extremely easy because there are no resins or sugars in the wood. In fact, it leaves tools and blades clean, with no gumming." Also, the wood comes out of the kiln about 30% lighter, making it easier to handle.

Speaking of handling, Ungaro names a benefit that none of the manufacturers identify: "Our guys don't have an itchy sensation like they do when using some of the exotic woods." ❖

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PHOTOS: LEFT, ROSARIO UNGARO; RIGHT, JIM SMITH