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-
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 Can-
ad—are northern ash and southern yel-
low pine, for decking and siding.
The decking is sold and priced as a pre-
mium product. The suppliers and deck
builders we spoke with say that thermal-
ly treated ash costs as much as or a bit
more than ipe, depending on the mar-
et. Southern yellow pine is priced on
par with cedar.

How It’s Made
The heat-treating process consists of plac-
ing wood in a kiln, slowly raising the tem-
perature to 400°F or more, and holding it
there for several hours. Because the tem-
peratures 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 nutrition-
al 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-treat-
ed 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 be-
cause 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 dur-
ing the process. “There is a strength re-
duction 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 treat-
ment, according to James: Thermally
modified ash has the same Janka resis-
tance rating as regular ash.

Pros and Cons
To be happy with this product, it’s impor-
tant 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 eventual-
ly,” says Mike McKay, a Wasaga Beach,
Ontario, deck and dock builder who built
a 750-square-foot deck from heat-treat-
ed 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
Thermally Modified Decking

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.

deeding 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. Eco-Vantage’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 3/4 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.”

Charles Wardell is a freelance writer based in Tisbury, Mass.