

Few alterations to a house are as welcome as a new exterior deck. Structurally sound, cosmetically pristine, a new deck invites dawdling, the grilling of steaks, conversation, rustic contemplation, an extra hour with the Sunday paper. Blessed with such a structure, you have to remember only one thing. Before the last deck board goes down, nature is already hard at work trying to destroy what you have wrought.

With no protection from rain or sunlight, exposure to wood-devouring insects and cycles of heat and cold, the deck is in an environment that is just plain unforgiving. It hardly matters whether the deck is a simple ground-level platform or a grand multilevel structure. They all sit out in the same weather. Unless rebuilding a deck every few years appeals to you, the design process ought to include finding decking that forestalls the aging process as long as possible while offering the best balance between cost and aesthetics.

Traditionally, decking has been wood. Depending on what part of the country you live in, that might be redwood, western red cedar or pressure-treated southern pine. Other types of wood decking also are becoming easier to find: Alaska yellow cedar; rain-forest hardwoods such as ipe; red meranti from Malaysia. In addition, two new categories of decking have appeared in recent years: composites of natural fiber and recycled plastic, and decking made entirely of extruded vinyl.

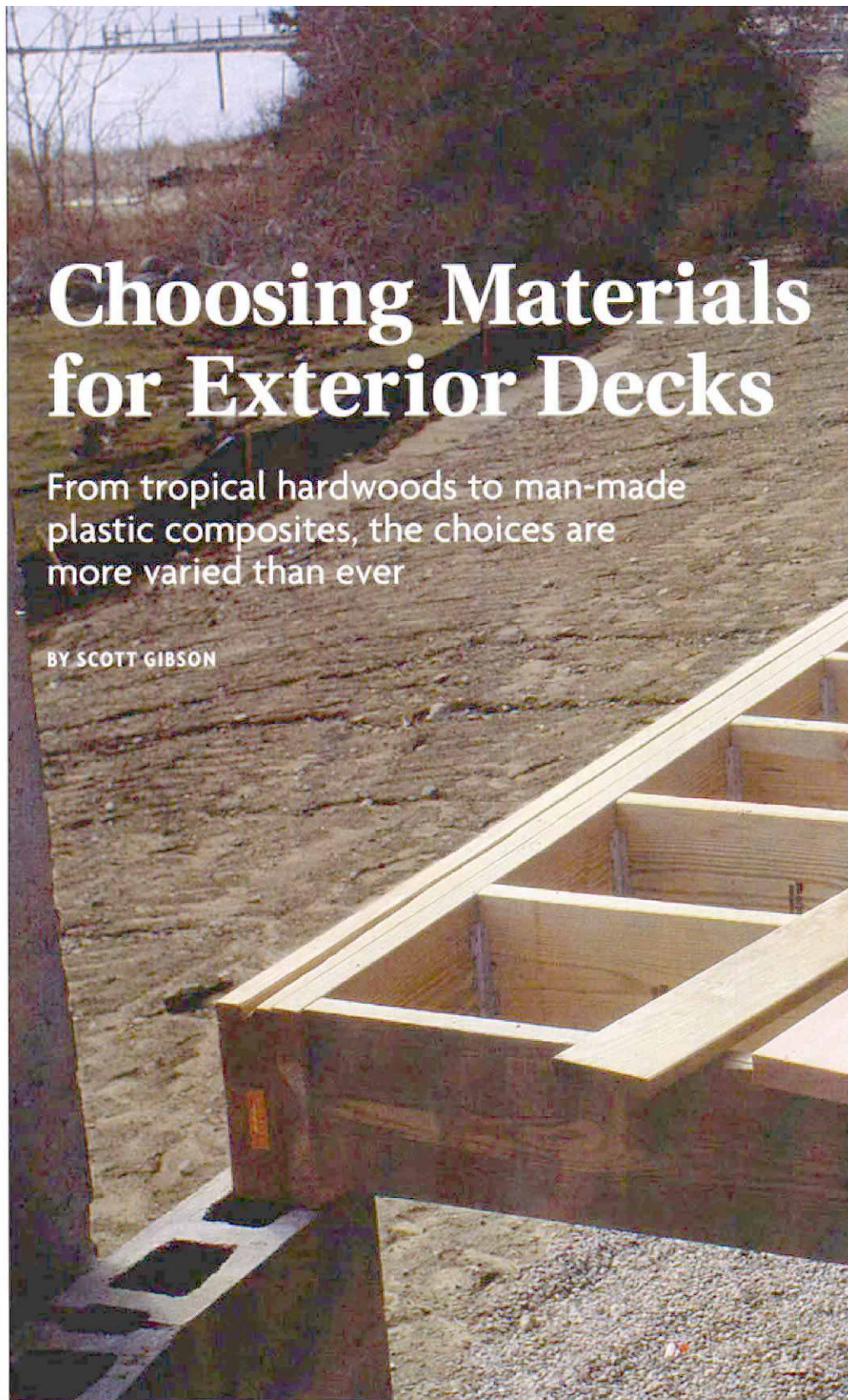
More decking choices that are also widely available

In all, there are more choices than ever before, with prices ranging from less than \$2 per sq. ft. to \$10 per sq. ft. of deck. All these materials should be available no matter where you live, either through your local lumberyard or directly from a more distant supplier. Internet shopping has made it a lot easier to find material you can't buy locally. Materials described on the following pages are widely used and widely available, but they are by no means your only choices. Prices fluctuate and may vary from one part of the country to another. Prices used here were obtained from a number of sources, including manufacturers, suppliers and retail-

Choosing Materials for Exterior Decks

From tropical hardwoods to man-made plastic composites, the choices are more varied than ever

BY SCOTT GIBSON



ers. They may be slightly higher or lower than the prices in your area. They do not include shipping.

In general, wood decking is sold either in 5/4 or 2-in. nominal thicknesses. After milling and drying, these boards are 1 in. or 1½ in. thick. An exception is tropical hardwoods, much stiffer and harder than North

American woods. These species are often sold in a nominal 1-in. thickness, measuring ¾ in. when you buy it, or 5/4 in. In residential decking, 5/4 material and 1-in. tropical hardwoods are generally intended for installation over framing spaced 16 in. o. c.; 2x material usually goes over 24-in. o. c. framing. The two most common widths are 4 in.



All decked out. Here's a sampling of the decking materials available today. From left to right: treated southern pine, redwood, Dream Deck vinyl decking, treated fir, Trex plastic composite decking, Nexwood plastic composite, ipé, Brock Deck vinyl decking.

and 6 in. In the western United States, 2x decking is most common; in the East, it's the 5/4 variety.

Resistance to decay and insects comes naturally to some wood species and can be improved chemically in others. But even the hardiest of wood decking will need attention from time to time. The U. S. De-

partment of Agriculture's Forest Products Laboratory advises that a good-quality water repellent should be applied to exterior decks every year or two.

Wood decking often can be ordered in a number of different grades, and here, confusion reigns supreme. Western red cedar is graded differently from redwood, for ex-

ample, and different suppliers may call the same grades by different names. Tropical hardwoods often are sold only in a clear grade. But in those species with well-defined grading rules, categories typically include a pricey clear grade, a tight-knot grade for less money and a still less expensive grade that allows a greater number of

defects, such as larger and more frequent knots or sapwood. The more you are willing to spend, the more cosmetically appealing the plank. More important is making sure the planks are cut from heartwood, which resists decay, and not from sapwood, which has virtually no natural protection against rot.

Forest politics can complicate your choice of wood decking

If only there were a way to talk about wood decking without bringing up the fate of the rain forests. It's not easy to do. Some of the best woods for exterior decking may come with high ecological costs, an issue that lumber consumers are increasingly encouraged to consider.

South American ipe, for example, has become readily available and, thanks to aggressive marketing, seems to be selling

"Before the last deck board goes down, nature is already hard at work trying to destroy what you have wrought."

briskly. Dense, hard, beautiful and naturally resistant to both decay and insects, ipe seems just about perfect for decking. But critics such as Tim Keating, director of an organization called Rainforest Relief, claim forestry practices in Brazil, one of several South American countries where ipe is cut, are "horrendous." Waste is extremely high, Keating says, with as much as an acre of forest cut to produce 10 bd. ft. of clear decking lumber. Enforcement of forestry regulations is said to be haphazard at best.

Importers see it differently. For example, the Thompson Mahogany Company in Philadelphia, which brings in between 2 million and 3 million bd. ft. of ipe a year, says it buys wood from reputable mills in South America that have not been cited for illegal cutting. Also, says Thompson, ipe (actually, a broad term for a number of similar species) is not listed as an endangered species. Nor has it been banned for international trade.

This contentious issue is not limited to lumber taken from South American rain

forests. If the debate seems confusing, it is. But it has given rise to organizations that certify lumber has been harvested under sound forestry practices. Certified lumber is harder to find and usually costs more. But due to rising public interest, it is increasingly available. The Forest Stewardship Council (www.fscoax.org) based in Oaxaca, Mexico, sets standards and accredits its inspection agencies, such as the Rainforest Alliance SmartWood (802-434-5491; www.smartwood.org) program based in Richmond, Vermont. SmartWood's Web site includes lists of certified-lumber brokers. The Certified Forest Products Council in Beaverton, Oregon, also promotes the use of certified wood and can provide information about forest-product certification if you want to know more (503-590-6600; www.certifiedwood.org).

Plastics and composites eliminate maintenance as well as guilt

Both types of man-made decking—composites of plastic and natural material and decking made of vinyl—claim three big advantages over wood. First, these materials need no regular maintenance beyond an annual scrubbing. Second, some types help to conserve natural resources by using recycled plastics. And third, the decking is more consistent with less waste.

Composites, such as Trex, are used almost like wood. The nominal 2x6 planks are fastened with screws to underlying framing spaced at either 16 in. o. c. or 24 in. o. c., depending on the brand. Composite decking may be either solid or hollow with internal ribs. It does not require any sealers, and manufacturers say there's no reason the decking won't last for 30 or 40 years. Solid plastic planks, which also come in several variations, are not through-fastened. Instead, planks are attached to framing with a vinyl or metal clip system.

Composite decking is more expensive than pressure-treated pine or tight-knot grades of western softwoods, but it is not as expensive as the top-of-the-line clear grades. Vinyl decking costs considerably more than composite.

No matter what kind of decking you decide to use, borrow or buy a copy of *Wood Decks*, a publication of the U. S. Department of Agriculture Forest Products Laboratory (608-231-9200; www.fpl.fs.fed.us) in Madison, Wisconsin. It covers everything from deck design and construction to deck maintenance.

Scott Gibson is a senior editor at *Fine Homebuilding*.

Treated southern pine is inexpensive but prone to movement

Treated southern pine's pale-green hue, which fades to gray over time, comes from the chromated copper arsenate (CCA) that gives the wood its longevity. Treated pine could be any one of four species: longleaf, shortleaf, slash or loblolly. For decking use, it is typically sold as 5/4 by 6-in. RED (radius-edge decking) in both standard grade and premium grade.

Pressure-treated southern pine is one of the least-expensive decking options around—about \$1.25 per lin. ft. for 5/4 by 6-in, premium grade RED, slightly less for standard.

CCA is the most common of several waterborne preservatives the Forest Products Lab characterizes as "broad-spectrum pesticides." It renders wood unusable as a food source for insects and fungi. A retention level of 0.25 lb. of preservative per cu. ft. is suggested for

Treated western softwoods are more common in the West

If Kmart sold wood decking, it would probably be pressure-treated hem-fir: a no-frills product that gets the job done for not a lot of money. Just like southern pine, western softwoods come from a big family. There are two groups, one consisting of Douglas fir and western larch, and the other, a hem-fir category that includes California red fir, grand fir, noble fir, Pacific silver fir, western hemlock and white fir. Pressure-treated decking made from these woods, typically stained to a cedarlike brown, shows up mostly in the western United States as 2x4s and 2x6s.

According to the Western Wood Products Association, treated hem-fir is the most popular treated softwood in the West. It's certainly the least expensive. Lumber suppliers in the West quote prices as low as 75¢ per lin. ft. for 2x6 pressure-treated hem-fir decking in a standard grade.



lumber used aboveground; lumber that will come into contact with the ground should be rated at 0.40 lb. per cu. ft.

Treated pine is relatively hard, but it has the reputation of moving around after it has been installed. Starting with dry lumber and applying a water repellent periodically will be a big help in reducing splitting, checking and cupping. Your best bet is to look for decking that has been kiln-dried or air-dried after treatment, or to air-dry it yourself before installing it.

In addition to CCA, a waxlike water repellent also is applied to some brands of treated pine. Usually available on premi-

um decking, it comes at a slightly higher cost. This treatment of repellent will save you the trouble of an initial application of water repellent, but it won't get you off the hook for good. A yearly reapplication of a good-quality water repellent is still recommended.

Because southern-pine species accept a chemical treatment so readily, it is not necessary to field-treat any end cuts or any holes that are made as the deck boards are installed.

Health warnings continue to dog CCA-treated wood, but risks seem relatively slight. The Southern Forest Products As-

sociation (Kenner, LA; 504-443-4464; www.southernpine.com), a trade group, suggests common-sense precautions: Wash your hands after handling the material, wear a dust mask and eye protection when cutting it, and do not burn treated wood. While raw chemicals used in the treating process are "kind of rough," the association says, they bond well to wood and do not leach out easily. As one association official says, CCA treatment "is about the safest one we've got." For more consumer information on CCA, try the American Wood Preservers Institute's Web site (www.awpi.org).

These softwoods, with thinner sapwood layers, are harder to treat than southern pine. In fact, chromated copper arsenate, the preservative du jour for most woods, can't be used on Douglas fir. Treaters switch to a waterborne chemical containing ammonia—either ACQ or ACZA—which does a better job of penetrating wood fibers. The surface of hard-to-treat woods also may be incised to meet industry standards for chemical penetration. The resulting pattern of knife slits makes

the wood a whole lot less appealing for use as decking.

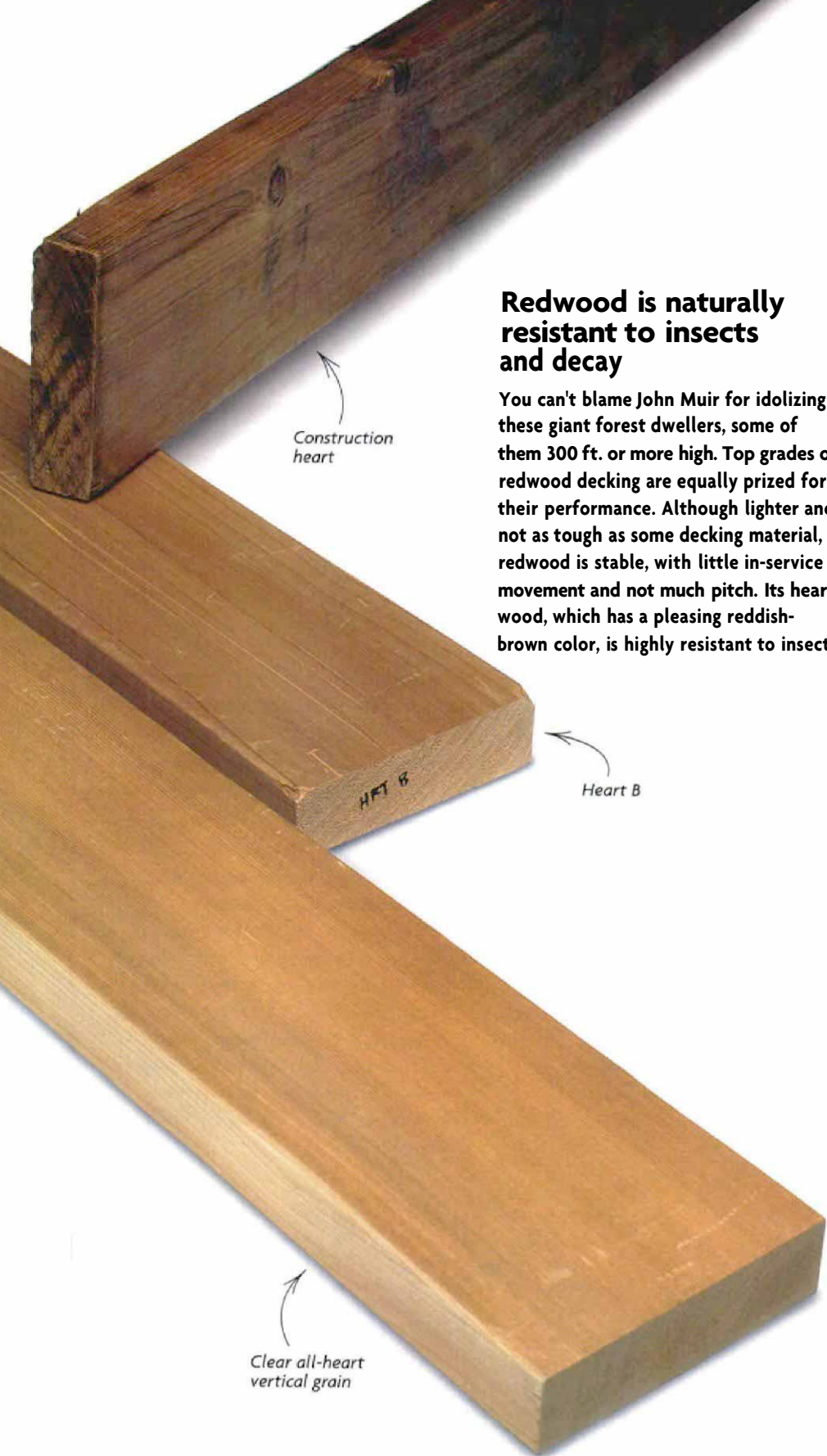
Several grades are available, but the supplier may have its own trade designation. For example, Exterior Wood Inc., a Washougal, Washington, supplier (800-833-0838), sells a treated hem-fir decking called X-Dek that is purchased as a structural select grade and then visually regraded for quality. Exterior's Outdoor Wood is also select stock but has not been regraded. It costs about 12¢ per lin.

ft. less than X-Dek. Although it is not incised, this wood is guaranteed against damage from fungus and termites.

According to the U. S. Forest Products Laboratory, treated western and southern species should have the same resistance to decay. But chemical treatments do not penetrate as deeply in western woods. As a result, end cuts and drilled holes should be treated with a water repellent right away. Use a product that contains at least 2% copper.

Treated hem-fir





Redwood is naturally resistant to insects and decay

You can't blame John Muir for idolizing these giant forest dwellers, some of them 300 ft. or more high. Top grades of redwood decking are equally prized for their performance. Although lighter and not as tough as some decking material, redwood is stable, with little in-service movement and not much pitch. Its heartwood, which has a pleasing reddish-brown color, is highly resistant to insects

and decay. It is easy to work, and it holds finishes well.

What more could you want? Well, a lower public profile would be a start. Bitter and well-publicized battles over remaining old-growth forests, most recently the Headwaters Grove in Northern California, have probably scared some people away from considering redwood for decking. But according to the California Redwood Association (Novato, CA; 415-382-0662; www.calredwood.org), 95% of the redwood on the market is second- and even third-growth wood cut from private land. California forestry laws are stringent, and what little old-growth wood is being cut is not as a rule going into decking. The association estimates that 650 million to 800 million bd. ft. of the fast-growing redwood is cut annually. That will remain stable for the next half-dozen years, and then actually increase. Certified redwood is available.

Redwood comes in more than 30 grades, of which only a few are typically used as exterior decking. They are deck heart/construction heart, B heart and clear all heart. Prices are about \$2 per lin. ft. for 2x6 deck heart, about \$3 per lin. ft. for B heart and \$4 and up per lin. ft. for clear all heart. It is available in 2x and 5/4 by 6-in. RED stock, although 5/4 decking is used mostly on the East Coast and not as much of it is cut.


Although the heartwood is exceptionally resistant to both rot and insects, sapwood is not. This factor is a key difference in some of the redwood grades—construction common contains sapwood, for instance, while construction heart does not. Although B heart and deck heart/construction heart both have knots, those in B heart are (less prominent).

The California Redwood Association suggests that you apply a protective finish every few years that contains mildewcides, water repellents and ultraviolet protection.

Construction heart

Heart B

Clear all-heart vertical grain



*Knotty western
red cedar*


Cedar is available in two pretty different species

Western red cedar and Alaska cedar are a lovely pair of Pacific Northwest woods. The heartwood of both species is highly resistant to decay, and they are both straight-grained, easy to work and dimensionally stable. Both are readily available as decking, particularly on the West Coast. While sharing these attributes, the woods are different.

The heartwood of western red cedar has a red to brown color. It is lighter in weight than Alaska cedar or even redwood, and is the softest of the three. Western red cedar has little shock resistance, but it also shows little shrinkage after it has been seasoned. It can be brittle and splintery. Yellow cedar is stronger and heavier with greater shock resistance and bending strength. It has a clear, bright color and is not as brittle. Alaska yellow cedar, which also may be marketed as Alaska cypress, weathers to a silver-gray.

Grades developed by the Western Red Cedar Lumber Association (604-684-0266; www.wrcla.org) range from architect clear to custom knotty. But as is the case with other species, suppliers may develop their own trade names, a practice that even the Western Wood Products Association admits is "difficult and confusing." Clear western red cedar in a 2x6 decking is about \$2.25 per lin. ft.; select tight knot is about half that. Prices for 5/4 material are slightly higher. For Alaska yellow cedar, 2x6 decking is about \$2.75 to \$3 per lin. ft. for clear material, and about \$1.20 per lin. ft. for a select tight-knot grade.


According to Bear Creek Lumber (800-597-7T91; www.bearcreeklumber.com), yellow cedar shrinks more than western red as it dries. As a result, it is often kiln-dried to minimize problems after installation. Because the wood is harder than red cedar, it is somewhat more difficult



*Clear western
red cedar*

to stain. Even though the heartwood of cedar naturally resists rot, a regular application of a water-repellent preservative is a good idea. It helps to protect the wood surface from mildew and weathering.

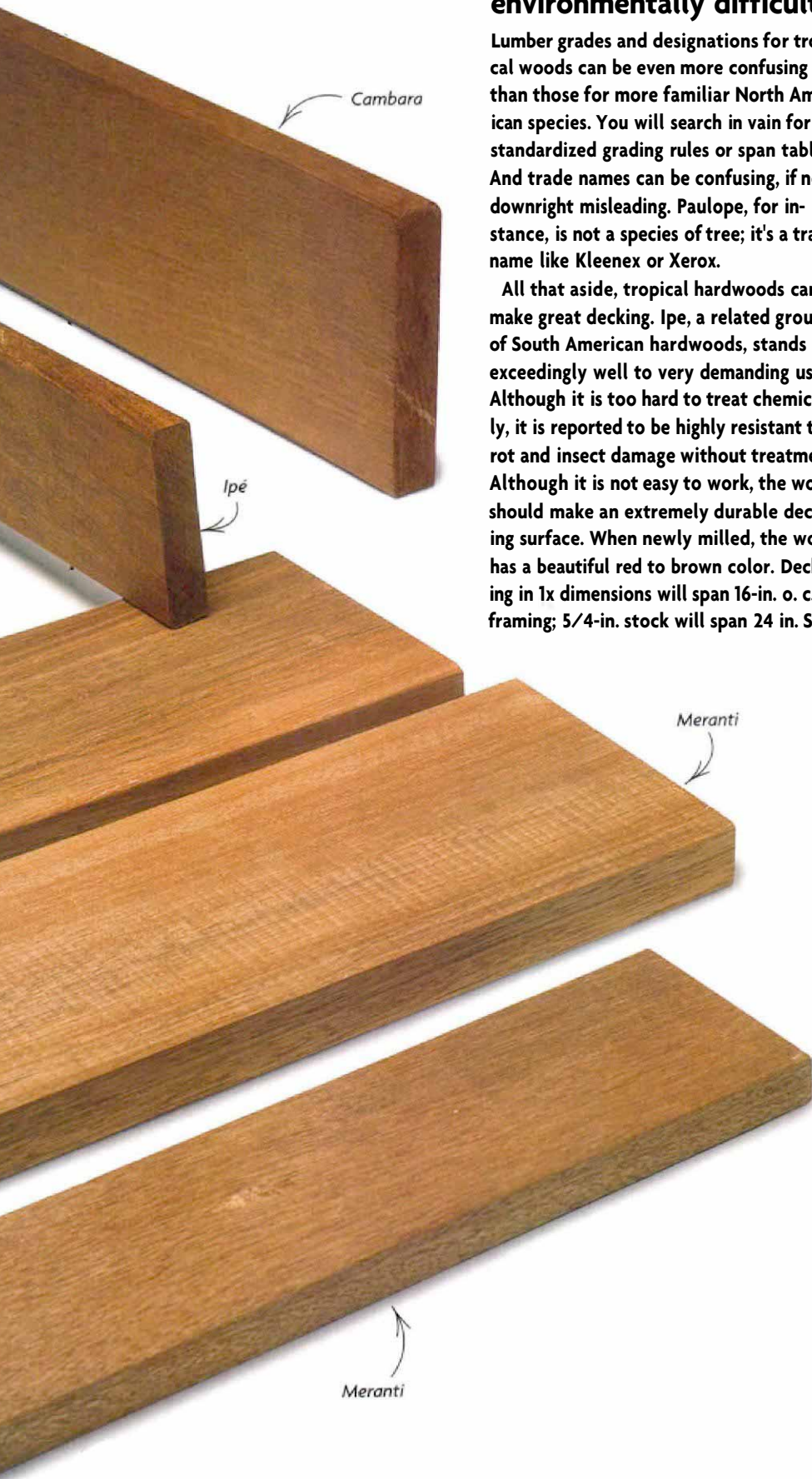
Other cedars used for decking include Port Orford and northern white. These species have many of the same strong points as northern red and Alaska yellow, but they are not harvested in the same quantities and are not as widely available.



*Knotty
yellow cedar*



Clear yellow cedar



Tropical hardwoods are nearly indestructible but environmentally difficult

Lumber grades and designations for tropical woods can be even more confusing than those for more familiar North American species. You will search in vain for standardized grading rules or span tables. And trade names can be confusing, if not downright misleading. Paulope, for instance, is not a species of tree; it's a trade name like Kleenex or Xerox.

All that aside, tropical hardwoods can make great decking. Ipe, a related group of South American hardwoods, stands up exceedingly well to very demanding use. Although it is too hard to treat chemically, it is reported to be highly resistant to rot and insect damage without treatment. Although it is not easy to work, the wood should make an extremely durable decking surface. When newly milled, the wood has a beautiful red to brown color. Decking in 1x dimensions will span 16-in. o. c. framing; 5/4-in. stock will span 24 in. Sold

as clear lumber, 1x4 decking starts at about \$1 per lin. ft.; 5/4 by 6-in. starts at roughly \$2.25 per lin. ft.

A number of companies in the United States have what's called "chain of custody" certification for ipe under Forest Stewardship Council guidelines. But according to Jon Jickling of SmartWood, these lumber brokers have nonexclusive contracts, meaning they technically may sell both certified and noncertified wood. You just have to ask for the one you want. Any company selling FSC-certified wood should be able to provide you with a chain-of-custody code to prove it. The catch is that supplies are limited, says Timber Holdings Limited of Milwaukee, Wisconsin (414-445-8989; www.ironwoods.com).

Although market demand for certified lumber is not huge at the moment, it is growing—even if certified wood costs a little more. Sylvania Certified (Santa Fe, NM; 800-468-6139; www.certifiedwood.com), for instance, quotes a price of \$4 per bd. ft., making the wood roughly 20% more costly than noncertified decking. In time, that price difference may decline.

There are probably many other tropical hardwoods that could be used as decking, although it is hard to ask for something that you don't know exists. Two others are these:

- **Cambara:** Lighter in color and not as hard as ipe, and lower in cost by 25% to 50%. Cambara is stiffer and heavier than any decking produced in North America, and is reported to be resistant to insects and decay. The Thompson Mahogany Company, a Philadelphia importer of both ipe and cambara (877-589-6637), says cambara should be treated periodically with a water repellent and preservative.
- **Meranti:** A common name for a number of species from Malaysia, the Philippines and other parts of Southeast Asia. Widely available from lumber dealers, it may be called Philippine mahogany or lauan. The Forest Products Laboratory rates this wood as moderately decay resistant, a step below redwood, cedar and ipe. Strength properties are comparable to red oak. Prices range from about 65¢ per lin. ft. for 1x4 decking to \$1.65 per lin. ft. for 5/4 RED stock.

Composite decking blends recycled plastic with wood waste

Decking that is made from recycled plastic and ground-up waste wood is designed to make you feel good about your new deck and your social values. Trex (Winchester, VA; 540-678-4070; www.trex.com) pioneered the technology of mixing recycled polyethylene and wood fiber. Trex is too flexible to be used as structural, load-bearing framing. But as decking, it works fine. Available in 5/4 by 6-in. and 2x sizes, Trex is designed to span 16-in. o. c. and 20-in. o. c. framing, respectively. Trex costs roughly \$1.45 per lin. ft. in the 5/4 size and \$1.60 per lin. ft. for 2x material.

Trex is nailed or screwed to framing just like a wood deck. No predrilling is necessary, and any fuzz left when a screw is driven through a board can be flattened with a hammer to hide the fastener. Trex's inherent flexibility can be an advantage in making curved deck parts (see FHB #111, pp. 64-69). Other than periodic cleaning, the composite materials do not need any maintenance.



Trex may have started the ball rolling, but similar products are now available. Some are solid planking, like Trex. Others are hollow in section with reinforcing ribs, such as Nexwood (Lasalle, PQ, Canada; 888-763-9966; www.nexwood.com) or TimberTech (Columbus, OH; 800-307-7780; www.timbertech.com). Nexwood is square-edged; TimberTech installs as tongue-and-groove planking.

Nexwood is different in that it combines recycled plastic and cellulose fiber in the form of rice hulls. The nominal 2x6 planking spans 24-in. o. c. framing and can be through-nailed or installed with concealed fasteners. One side has a brushed surface that improves both traction and aesthetics. Nexwood says it hopes to of-

fer the decking, which costs between \$1.70 and \$2 per lin. ft., anywhere in the United States by the end of 2000.

Composites haven't been around long enough to study their performance over the long haul. Bob Falk, a research engineer at the U. S. Forest Products Laboratory, says one area of interest is whether creep—a long-term deflection under load—will prove critical for deck design.

Vinyl decking is pricey but nearly maintenance-free

It seems fitting that an industry offering plastic clapboards, plastic bathtubs and plastic kitchen countertops eventually would get around to plastic exterior decking. Extruded from solid polyvinyl chloride (PVC), these products are splinter-free, are inedible to insects, and are fungi- and maintenance-free. Manufacturers say the nominal 2x6 planks resist mildew and UV-damage.

One such product is Dream Deck (Thermal Industries Inc., Pittsburgh, PA; 800-245-1540; www.thermalindustries.com). Planks are designed to span either 24 in. or 48 in., depending on whether you use an aluminum or vinyl track. After the track has been attached to deck framing, planks are snapped into place so that there are no exposed fasteners. The company says Dream Deck is made of recycled vinyl capped with a layer of virgin plastic to increase longevity and cosmet-

ic appeal. List price is \$4 per lin. ft., making it far from cheap, although the company says that builders can expect to see steep discounts.

Brock Deck (Royal Crown Ltd., Milford, IN; 800-488-5245; www.royalcrownltd.com) uses a similar approach. Planks clip to metal strips that have been screwed to decking (maximum span is 24 in.). The ends of the planks are covered with plastic trim. The nominal 2x6 decking costs about \$4.50 per lin. ft.

