

# A Walk Through Wood Floors

Strip oak is not the only option, but without some guidelines, choosing among strip, plank, prefinished, solid and engineered floors can be tough

by Roe A. Osborn

**D**uring the building boom of the late 1940s and the 1950s, carpeting and synthetic sheet material replaced wood flooring as America's flooring of choice. These floor coverings were much quicker and easier to install than labor-intensive wood-strip floors, and Americans got used to the feeling of fuzz under their feet.

But carpet requires constant maintenance (vacuuming), and its very nature makes it difficult to clean. Warm, fuzzy carpet can support whole cities of microscopic dust mites that cause allergic reactions in humans. And even the best grades of carpet show signs of fatigue after only a few years. The desire for flooring that is more permanent, easier to keep clean and more conducive to a healthful indoor environment has folks returning to wood floors.

But a spin through the wood-flooring section of your local home center or flooring supplier can be extremely confusing. You'll have to navigate through choices in wood species, color, composition and finish, as well as installation methods to come up with a wood-floor decision

that will suit your circumstances, your taste and your budget.

**Start with the finish**—Wood flooring comes either unfinished, which requires sanding and finishing after it is installed, or prefinished in the factory. Unfinished flooring is still the most popular type of wood flooring. At first glance, unfinished-wood flooring seems like the obvious choice from an off-the-shelf cost standpoint. At home centers here in western Connecticut, unfinished oak strip flooring goes for about \$1.80 to \$2.50 per sq. ft. But unless you plan to install, sand and finish the floors yourself, figure on that price at least doubling when the installer and finisher weigh in.

With unfinished floors, the quality of the final finish depends entirely on the installer, the type and grade of finish used, the number of coats applied and the care taken with the application. That adds up to a lot of variables. Polyurethane is the most common finish, and polys are either water based or oil based. Oil-based polys take

longer to dry and produce noxious fumes, but they penetrate better into the wood surface. Water-based polys dry quickly and produce fewer fumes and a harder finish, but the water tends to raise the grain in the wood, so the floor requires more sanding between coats.

Some installers will also do special oil or wax finishes. These finishes are not as harsh looking as the more shiny polyurethanes. Also, high-traffic areas can be refinished and blended in seamlessly with the rest of a floor that has a wax finish. With a polyurethane finish, refinishing one area usually means refinishing the entire floor.

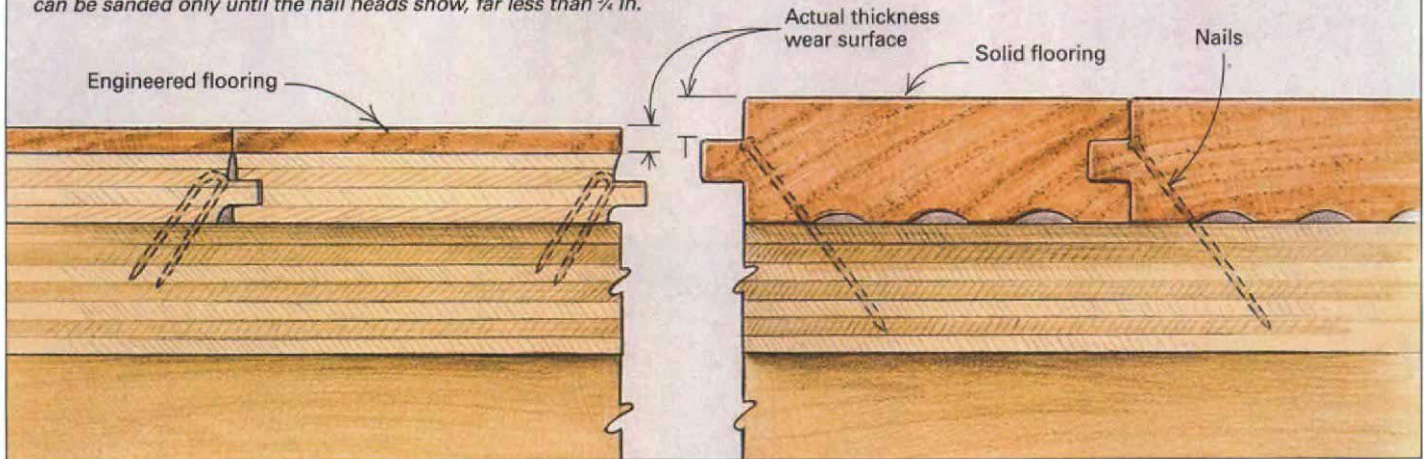
If you're installing unfinished flooring in an existing house, you'll also have to live with the dust and fumes from installation, sanding and finishing. But probably the biggest disadvantage to unfinished flooring is the four-day to five-day wait before you can walk on the floor (maybe less with water-based finishes). That wait is not only an inconvenience to the homeowner but also holds up all the other trades. To the general contractor as well as the subs, unfinished-



**Unfinished solid-wood flooring.** Strip flooring (left) is made of solid wood cut to 2¼ in. wide with a tongue and groove milled on the sides and ends. Plank flooring such as the heart pine made by Authentic Pine Floors (right) comes in widths from 4 in. to over 10 in. by special order.

**Solid-wood flooring is only good down to the nails.**

*A common misperception is that solid flooring, being 3/4 in. thick, will wear much longer than engineered flooring. But actually, solid wood can be sanded only until the nail heads show, far less than 3/4 in.*



hardwood floors often mean waiting an extra week for that final payment from the bank.

**Leave the finishing mess at the factory**—On the other hand, you can install prefinished flooring in the morning and entertain guests on it before the ink dries on the contractor's check.

The most common factory finish is acrylic, a plastic finish similar to polyurethane that cures by exposure to ultraviolet light. The finish is applied under clean conditions at the factory and cures quickly with none of the airborne dust that can settle onto wet varnish at a job site. Acrylic has a luster similar to polyurethane, but if you prefer a softer, hand-rubbed look, companies such as Bruce Hardwood (800-7224647) offer a wax finish as an alternative to their standard finish.

Most wood floors develop overwood, or slight differences in height from board to board, after a year or two of seasonal changes in temperature and humidity. To keep overwood to a minimum, prefinished flooring is milled and finished

to extremely close tolerances and then sealed in plastic for shipping. Because unfinished flooring is to be sanded and finished after installation, milling is not as critical.

Another way makers of prefinished flooring deal with inevitable differences in thickness is by adding a slight chamfer at the edge of each board. The size of the chamfer varies depending on the product from slightly eased to full, deep V-grooves. The chamfered edges do a good job of disguising differences in height, but they catch dirt and dust, which makes cleaning tougher. Also, chamfered edges impart an overall texture to the floor, which can ruin the effect of having one seamless slab of wood for a floor.

With the messiest part of wood-floor installation done at the factory, you'd think that choosing prefinished flooring would always make the most sense. But the cheapest prefinished flooring is still almost twice the price of its unfinished neighbor. And installation is a bit more demanding because minor defects in the edges or ends of the flooring are yours to keep, and a tiny

pebble lodged in the installer's shoe could ruin the floor before you've even had a chance to walk on it. Installers increase their fees accordingly for prefinished flooring, typically charging 10% to 15% more per sq. ft. than they charge for installing unfinished flooring.

Prefinished flooring is often stained as part of the process to give you choices of color. Unfinished flooring can also be stained, but at an additional cost typically of between 30¢ to 40¢ per sq. ft. plus an extra day of finishing time. The quick, clean installation of prefinished flooring makes the most sense when time and tidiness are at a premium, which is especially true for remodeling jobs.

**Oak strip flooring is the most popular**—

Solid-wood flooring (prefinished and unfinished) is divided into two categories: strips, which are narrow boards that are cut 2 1/4 in. wide, and planks, which are boards 3 in. or wider. Although strip flooring is offered prefinished, unfinished oak strip flooring makes up



**Prefinished engineered flooring.** Anderson's engineered flooring (left) is made as single boards with eased edges to hide slight differences in thickness. Harris-Tarkett's LongStrip flooring (right) is made from multiple pieces of veneer laminated to a single substrate.





**Adding texture at the factory.** Country Classics predistresses its fir flooring by adding various textures after the flooring is milled. The top sample has been wire-brushed, which removes some of the softer wood, leaving the grain raised. The bottom two samples have saw marks left in the wood to give the floor a rough-sawn look. Note: The solid-plank flooring was mounted on plywood for display purposes.

over half of the wood-flooring market (bottom photo, p. 52).

Strip flooring comes in random-length boards. A tongue-and-groove pattern is also cut into the ends of each strip, a process known as end matching. The strips are then graded for knots, grain and defects. The best grades with the fewest knots and defects are usually called clear or select. The next lower grade, called common or #2, has more and bigger knots and more variations in color. The lowest-grade flooring is called rustic, or farm grade. Beware of lower grades. Because of defects, you may find a large portion of each bundle of flooring unusable.

Strip flooring is usually attached to a wood subfloor with nails driven through the tongue. When you consider all those narrow boards interlocked and nailed to the subfloor every 8 in. or so, strip flooring adds a lot of overall strength to a floor. Bruce Donahue of Christian Brothers Hardwood Flooring (401-272-2525) in Johnston, Rhode Island, said that his installers typically use 5,000 nails for every 600 sq. ft. of strip flooring, about twice what they use for plank floors.

Strip flooring is usually available in either red or white oak. According to Bruce Donahue, white oak finishes darker and has brown tones, while red oak has a pink hue. White oak is also denser and harder than red oak.

Besides oak, strip flooring is available in many other species, the most common of which is maple. Some folks want the light color of maple to brighten a room. Maple is a bit harder than oak, although not nearly as stable. In regions such as the Northeast, which has wide swings in temperature and humidity, maple is more likely to develop gaps between boards when installed. Maple is also more expensive than oak.

**Plank flooring means bigger gaps**—Plank flooring is readily available in widths from 3 in. to 10 in., but many manufacturers can special-order widths up to 2 ft. in some species. As with strip flooring, oak and maple are the most common species for plank flooring. However, plank flooring is also offered in other species, including yellow pine, white pine, cherry and hickory, plus a wide variety of more exotic species both imported and domestic.

*Engineered flooring doesn't expand and contract with changes in temperature and moisture as much as solid wood does.*

Plank flooring is graded similarly to strips. The wider, clearer and less common the species you choose, the more you can expect to pay for flooring. On the whole, plank flooring is more expensive than strip flooring. The only plank flooring in stock at our local home center is prefinished oak, ranging between \$7.50 and \$10.50 persq. ft. (excluding installation). Local retailers and mail-order lumber companies can probably beat that price, but with unfinished planks:

Like strip flooring, plank flooring is usually edge-nailed through the tongue, but the wider

the planks, the fewer nails there are holding the wood down to the subfloor. The result is that plank flooring wider than 5 in. has a tendency to cup or curl up across its width over time. For this reason, many flooring manufacturers recommend additional fastening (nails or screws and plugs) through the face of planks wider than 5 in.

One of the biggest drawbacks to plank floors is that the wider the planks are, the wider the inevitable cracks or gaps that form between them as the planks expand and contract with the seasons. Wood moves the same amount per inch whether it's 2¼ in. wide or 12 in. wide. But with a strip floor, there are more seams to distribute the gaps that develop, so the gaps between the boards are narrower.

In floors with 10-in. or wider planks, gaps of up to ⅛ in. are not uncommon. Although these gaps are to be expected and are considered part of the rustic nature of a plank floor, they could horrify an unsuspecting client or homeowner.

**Softwood flooring is not as crazy as it sounds**—Here in the Northeast, white-pine plank flooring is often specified for a traditional colonial look. As you might imagine, white pine makes extremely soft flooring. It typically has large knots and a varied grain figure, but it's usually available in widths up to 2 ft.

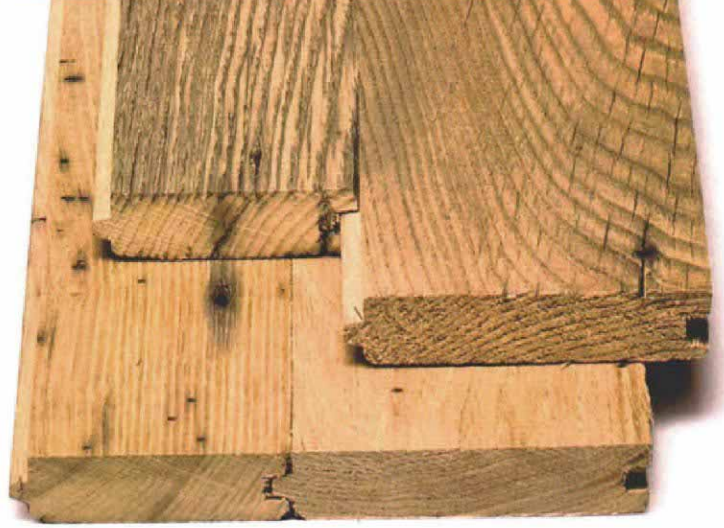
Part of the white-pine look is the distressing that occurs naturally with use. A golden retriever with long nails can make a white-pine floor look 200 years old in short order. Wide white-pine flooring is also notorious for developing wide gaps between planks.

Many specialty-flooring companies produce heart-pine flooring, which comes either from re-





**Recycled engineered flooring.** International Wood Products slices thin veneer from old beams and flooring and laminates them into a more stable engineered flooring. Their products are also available prefinished with tung oil.



**Recycled solid flooring.** Vintage Lumber makes solid flooring from reclaimed lumber. Their Vintage grade on the bottom has fewer defects and less color variation than the Vintage Distressed grade on the top.

cycled beams or from the dense centers of long-leaf southern yellow-pine trees (photo right p. 52). Heart pine is a distinctive red, and it is close to the hardness of red oak. Shelley McMurry from Authentic Pine Floors in Georgia (800-283-6038) says that the more red in the plank, the more expensive the grade of flooring. New-cut heart pine sells for between \$2.75 and \$5.25 per sq. ft., and recycled sells from \$4.75 to \$12 per sq. ft.

Fir flooring was used widely in this country during the early part of this century but is now most popular in the Northwest. Fir flooring is harder and denser than most pines, shrinks less than pine and turns a deep amber with age. Millwork of Idaho (208-264-7385) makes their Country Classic fir plank flooring in widths up to 7 in. (photo facing page). Their flooring is available with either a smooth or a wire-brushed finish. And for 15¢ extra per sq. ft., a circular-sawn or resawn texture can be added to the plank surface.

**Engineered-wood floors are glued up in layers**—The biggest advantage to engineered flooring is its stability. Because engineered flooring is glued up in layers like plywood, it doesn't expand and contract with changes in temperature and moisture as much as solid wood does. Large gaps are less likely to form between strips of engineered flooring. Engineered flooring is also less likely to cup and warp. In fact, most engineered-flooring manufacturers warranty their products against delamination and warpage for the life of the floor.

Made to look like strip or plank flooring when installed, engineered-wood flooring is available in widths from 2¼ in. to 7 in. (photos p. 53). It too comes in a wide variety of colors and

species as well as different grades of rusticity. It is available in both square edge and eased edge, and virtually all engineered flooring comes prefinished. The thickness of engineered flooring varies from ⅜ in. to ¾ in. The number and the thickness of the plies vary among manufacturers, but similar to plywood, more plies usually indicate a stronger, more stable product.

Most companies sell engineered flooring with the top veneer made from a single piece of wood. With this type of product, each section of flooring represents a single board in the finished floor. However, some products, such as Harris-Tarkett's LongStrip flooring (800-842-7816), are made from many smaller pieces of veneer arranged side to side and end to end on single-flooring units 8 ft. long and 7½ in. wide. The larger the units, the quicker the installation.

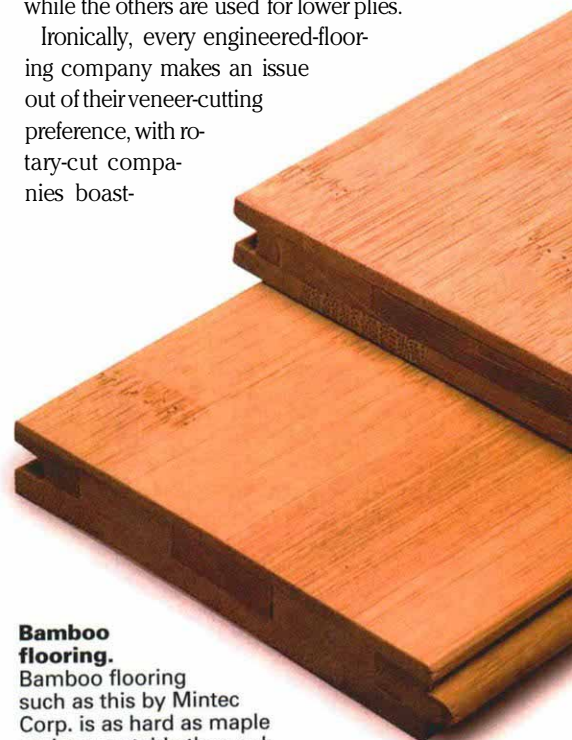
The thicker the top layer of wood, the more times the floor can be sanded and refinished, and the longer the overall life span of an engineered floor. The best engineered-floor warranties say that the floors can be sanded and refinished three times. Engineered-flooring prices also vary greatly depending on the thickness of the product, the number of laminations and the wood used for the top layer. For instance, at the local home center, ⅜-in. 3-ply maple flooring was over a dollar more than ⅜-in. 5-ply oak.

Some people mistakenly think that ¾-in. thick solid-wood flooring has a full ¾ in. of wood to wear through. Bill Clossin of Harris-Tarkett, a company that makes both solid flooring and engineered flooring, points out that because solid flooring is edge-nailed, it can actually be sanded down only until the heads of the nails start to show (drawing p. 53). The amount of wood above the nail heads in ¾-in. solid flooring is on-

ly slightly thicker than the top veneer in the better grades of engineered floor.

One disadvantage to engineered flooring is that while the top veneers are made of beautiful hardwoods, most often the lower plies of the flooring are made of softwood. Flooring with a softwood core is more prone to denting than solid wood. At least one company, Anderson Hardwood Floors of Clinton, South Carolina (864-833-6250), uses hardwood veneers for all layers of their engineered floors. The best veneers become the top layer of the flooring, while the others are used for lower plies.

Ironically, every engineered-flooring company makes an issue out of their veneer-cutting preference, with rotary-cut companies boast-



**Bamboo flooring.** Bamboo flooring such as this by Mintec Corp. is as hard as maple and more stable than oak, and it is made from a plant that takes four to five years to mature.





**Recycled wood made into pavers.** End cuts from recycled beams are glued down and then grouted with ground cork to make this floor product by International Wood.

ing that their product is more environmentally sound, while sliced or sawn companies tout their products as being better looking. Rotary-cut veneer is peeled to get the maximum yield from the tree. But sliced veneer, which produces waste from each saw kerf, has a grain pattern that is more like a solid floor. To rotary-cut veneer, a log is spun like a spindle in a lathe. A thin blade running parallel to the log peels the veneer off in a thin layer that leaves very little wasted wood.

**Spreading glue, sinking nails and floating floors**—Solid strip or plank flooring has to be nailed to something. So if you happen to live where houses are commonly built on concrete slabs, such as in the Southwest, wood flooring can be a challenge.

Paul Fuge of Plaza Hardwood (505466-2020) in Santa Fe, New Mexico, says a concrete floor in the Southwest typically is left for months to dry completely before a wood floor can be installed over it. Also, if the slab is radiant-heated, the heat must be turned on to hasten the drying process. If solid wood is being put down, Fuge suggests first installing a vapor barrier and then two layers of plywood screwed together. The solid-wood flooring is then nailed to the plywood. This process adds 1 in. to 1½ in. to the height of the floor and costs around \$2 to \$3 per sq. ft. over and above the price of the flooring.

Engineered flooring can be nailed or stapled to any subfloor, and because engineered wood is actually a plywood product, it can also be glued directly to a concrete slab. Putting an engineered floor over a slab usually adds less than

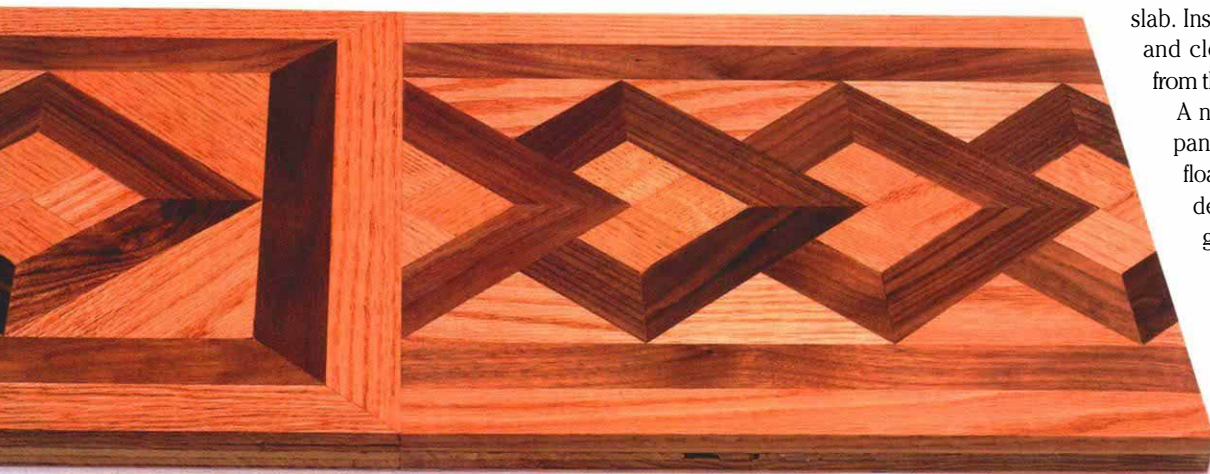
¾ in. to the floor height, and installation costs half that of solid wood.

Gluing down an engineered floor to a slab is fairly straightforward. Manufacturers usually provide or specify an adhesive that is spread on the concrete with a toothed trowel. The flooring is then pressed into place. The adhesives are designed to stay flexible over time so that the flooring will stay well adhered. The problem with this system is that after flooring is glued to concrete, it has no give, and walking on it is much the same as walking on concrete.

A floating floor, however, is installed over a thin layer of foam that acts as a resilient backing for the wood, making it much more comfortable underfoot. Although floating floors can be installed over any type of subfloor, they are most commonly used over concrete. And because it can move independently from the floor below, a floating floor works well over a radiant slab. Installation of a floating floor is quick and clean; also, there is no off-gassing from the adhesives.

A narrow space has to be left for expansion around the perimeter of a floating floor. That space is hidden under the baseboard. A small bead of glue is squirted along the tongue of each board as the floor is being assembled to hold the boards together. Paul Fuge says the only time floating floors don't seem to work as well is for large expanses, such as in a 20-ft. by 30-ft. living room. In these cases Fuge recommends installing the flooring over a single layer of plywood.

One company, Junckers (pronounced "yonkers"; 800-



**Custom border.** This border is one of the stock patterns that Kentucky Wood Floors can make. Made of quartered red oak and walnut, these are just two of dozens of species KWF uses to make custom flooring in almost any pattern imaginable.



**A floating-floor system for solid wood.**

Junckers makes this plank-flooring system specifically designed to be installed without glue or nails. The planks are joined with clips and put down on top of a damp-proof membrane. The floor is left to "float" over a slab or subfloor without being directly attached.

878-9663), a hardwood-plank flooring manufacturer in Anaheim, California (photo above), makes a solid-wood floating-floor system. Each Junckers plank is actually two strips of hardwood glued and dovetailed together. Their flooring is made either  $\frac{3}{8}$  in. or  $\frac{1}{2}$  in. thick. The wood is compressed 20% under steam and pressure before it is milled and sealed, which enhances stability and encourages the wood to expand and contract in thickness rather than in width as temperature and humidity change.

Junckers cuts a saw kerf in the underside of the plank where special metal clips are inserted to join the planks together. The planks come prefinished, so they are ready to walk on when the last plank is snapped into place. Also, they come in a variety of hardwood species and can be installed over radiant slabs.

**Wood flooring from recycled wood**—Today, dozens of companies are turning timbers and flooring from old abandoned buildings into new flooring. Flooring from recycled lumber is not only an environmentally sound practice, but the flooring produced is also full of character. One such company, Vintage Lumber (800-499-7859) in Woodsboro, Maryland, has been milling flooring from reclaimed lumber for over 20 years.

Like most recycled flooring, Vintage Lumber's flooring comes unfinished in random lengths and widths from 3 in. to 16 in. wide in some species. They offer eight species with two grades for each species (photo top right, p. 55). One grade has fewer defects and more uniform color, and the other has nail holes, knots, insect scars and distinct variations in color.

Another Maryland company, International Wood Products (800-950-0387), manufactures engineered flooring from recycled lumber that combines its rustic character with the stability of

engineered flooring. International Wood makes another interesting recycled-wood floor product that recalls the end-grain flooring that was often installed in factories and mills. They call this flooring Cobbled Wood Endblock (top photo, facing page), and it is made from end-grain slices of recycled beams. About  $\frac{3}{4}$  in. thick, these end blocks are bedded in adhesive on top of the subfloor. A grout made from ground-up cork is then troweled into the gaps between the

**For more information  
on wood flooring**

**National Wood Flooring Association**  
233 Old Meramec Station Road  
Manchester, MO 63021  
(800) 422-4556 (U. S.)  
(800) 848-8824 (Canada)

**The Hardwood Council**  
P. O. Box 525  
Oakmont, PA 15139  
(412) 281-4980

**National Oak Flooring Manufacturers  
Association**  
22 N. Front St., Suite 660, Falls Building  
Memphis, TN 38103  
(901) 526-5016

blocks, and the cobbled floor with all its exposed end grain wears like iron.

**Flooring from grass**—One of the most environmentally sound and sustainable wood-floor products is not wood at all. Bamboo, which is a grass, is grown in controlled forests in China (bottom photo, p. 55). According to Francois Miton of the Mintec Corporation (410-296-6688) of Towson, Maryland, bamboo reaches maturity in just four to five years; then it is harvested and cut into long, thin strips just over an inch wide.

The strips are glued up in layers to form an engineered product  $\frac{3}{8}$  in. to  $\frac{3}{4}$  in. thick.

Bamboo flooring comes either unfinished or prefinished. Because bamboo is not a tree, there are no knots to contend with. The bamboo plant grows in segments separated by nodes. Those nodes create a soft, slightly darker figure at random intervals in every flooring strip. Bamboo flooring tests as hard as maple. Bamboo is also 50% more stable than red oak, and it is priced to be comparable to similar engineered-wood flooring on the market.

**Custom flooring is expensive**—If money is no object and you're looking to install a custom-wood floor of some rare species such as burled walnut or curly bubinga, or if you wish to install a floor laid out in some complex interwoven pattern, you can either try to find a highly skilled craftsman who has an amazing inventory of wood, or you can call a custom-floorshop.

Custom-flooring companies generally do not stain their wood. Instead, they offer an incredible variety of species to furnish whatever color your heart and floor desire. One such company, Kentucky Wood Floors in Louisville (502-451-6024) creates panels with elaborate three-dimensional patterns in addition to their plank and strip flooring. These panels are preassembled in an assortment of beautiful stock or custom patterns that can be installed by just about any flooring contractor.

Custom-flooring manufacturers also create borders (bottom photo, facing page). You can choose a stock pattern or create your own. The borders are ready-to-install modules, and your flooring contractor just lays them in place. □

*Roe A. Osborn is an associate editor at Fine Homebuilding. Photos by Scott Phillips.*