

Synthetic Decking Takes Off

Now available in a variety of colors and textures, this durable array of products won't rot, splinter, or crack.

What's not to like?

BY CHRIS GREEN

It wasn't that hard to persuade Atlanta-based deck builder Donnie Miller to switch to synthetic decking. "Deep down, everyone likes wood," Miller says. "But most people aren't willing to do all the maintenance that keeps a wood deck looking good."

Synthetic decking certainly provides a no-maintenance alternative to wood. Until recently, though, the limited variety of synthetic-decking colors and styles has been a turnoff for many designers, builders, and homeowners. No more. Today, more than 60 different brands of synthetic decking are available, with an impressive selection of colors, textures, and styles.

Cost is still an issue

The major objection to man-made decking is cost. Depending on the synthetic decking



you choose, costs range from 2 to 5 times that of pressure-treated wood. Bear Board, one of the least-expensive brands of synthetic decking, costs around \$1.89 per lin. ft. At the high end, you can pay up to \$5 per lin. ft. for vinyl-decking boards.

When synthetic materials are viewed as part of a complete job, however, costs are more in line, averaging 25% to 50% more than a pressure-treated wooden deck, depending on your choice of materials.

Consider appearance, availability, and installation details

Once you get past the cost of these new man-made decking products, appearance is likely to be the biggest factor in what to choose. A world of color beyond the wastepaper gray of the early 1990s now is available. Many products come in four colors, and as shown below, Trex's Brasilia decking resembles exotic

hardwoods. Textures range from smooth to coarse wood-grain patterns. Some, like EverGrain and Procell, are more convincing than others. Accessories such as handrails, balusters, trim boards, and moldings are common.

There is one other subjective aspect of appearance to consider: the way a particular decking matches your house. Some are smooth, others rustic, and still others look like plastic. Your house will provide clues about which direction to go.

Once you find what you like, you have to make sure you can get your hands on the product. Even though more than 60 U.S. companies now are making various synthetic-decking products, local access to more than a dozen of these products is unlikely. Most lumberyards and home centers stock no more than a few brands. To get a less popular brand, you can order directly from the manufacturer, but you'll pay extra for shipping.

The news about installation details and workability of synthetic decking is mostly good. Ordinary carbide-tipped cutting

tools easily cut and shape these highly consistent materials. Contractors prefer working with composites over wood because there's no waste due to material defects. One downside, however, is weight. Some of the composites approach 3 lb. per lin. ft.

For custom-routed edge profiles, you must buy solid decking. Hollow or ribbed decking, which is usually thinner and lighter, can't be milled to create custom profiles, so end caps and channels are used as edging. A range of readily available hidden and other fasteners installs at least as quickly as they do in wood (sidebar p. 48).

Products continue to improve

Before spending thousands on a product that's still relatively new, you may have questions about manufacturers' claims. Warranties of 10, 25, and even 50 years are common. Will the synthetic material really hold up? A little perspective might help.

In truth, synthetics and wood-plastic composites (WPCs) aren't all that new. One of the first examples of WPCs was a gear-shift knob for a 1916 Rolls-Royce; that gear-shift knob was composed of wood flour and Bakelite, the first modern plastic. Made from phenol and formaldehyde, Bakelite became "the material of a thou-

Main text continued on p. 49

Synthetics gain on treated lumber

- 80%** Market share of pressure-treated decking in 2004.
 - 198%** Increase in synthetic-decking sales from 2000 to 2004.
 - 4%** Decrease in market share of pressure-treated lumber from 2000 to 2004 (84% to 80%).
 - 23%** Expected annual growth of wood-plastic composite decking from 2004 to 2009.
 - 0%** Expected annual growth of pressure-treated lumber from 2004 to 2009.
- Analysis provided by Lou Rossi, senior partner with Principia Partners, an Exton, Pa., consulting firm focused on the building industry.



Which one is mahogany?

FAKE WOOD NEVER LOOKED SO GOOD

Of the four samples at left, two are wood, and two are not. On the far left is a sample of Trex's new Brasilia decking in cayenne. The piece of wood to its right is ipé. On the near left, it's Trex again, this time in burnished amber; to its left is a piece of Cambara mahogany.

APPEARANCE, COST, AND

More than 60 manufacturers nationwide now produce synthetic-decking products. We don't have space to feature every product, so we're focusing on those that are most widely available, and those with unique products or features. Choosing won't be easy. Products look better than ever with convincing colors, textures, handrail systems, and trim profiles available. That said, distribution is spotty. Product availability will have a big influence on what you buy. Shop prices carefully; they vary, sometimes wildly within the same area.

POLYETHYLENE-BASED COMPOSITES

More wood-plastic composite decking is sold than all other synthetic decking combined, and polyethylene-wood blends lead the way. They are durable, strong enough to be used as decking, and easy to work with. They are, however, softer than the other plastics, which limits the joist spacing and makes them wear a little more easily.

POLYPROPYLENE-BASED COMPOSITES

Polypropylene and wood-fiber composites are currently a smaller part of the market. They use a stiffer, denser plastic capable of spanning longer distances. Using screws to fasten the decking without predrilling isn't recommended. The examples shown here have grooved edges to accept hidden fasteners.

WOOD-FREE PLASTICS

The products in this category are a small but growing part of the synthetic decking sold. Some are all plastic. Others are mostly plastic with some nonwood fiber added. The benefit is that problems with mold and seasonal movement caused by the moisture in wood are eliminated.

POLYETHYLENE-BASED

ChoiceDek is available in 5/4x6 and 2x6 planks in a variety of colors in 12-ft., 16-ft., and 18-ft. lengths. It includes a handrail system and is made from 100% recycled material. Fastening with 3-in. stainless-steel screws is recommended. ChoiceDek has a limited lifetime warranty. Cost of a 5/4x6 plank is about \$1.75 per lin. ft. **A.E.R.T. Inc.;** 800-951-5117; www.choicedek.com

TimberTech comes in 5/4x6, 2x6, and 2x6 tongue-and-groove planks in four colors in 12-ft., 16-ft., and 20-ft. lengths. The 2x6 and 2x6 tongue-and-groove planks will span 24 in. o.c. Stainless-steel or coated deck screws are recommended as fasteners. TimberTech comes with a handrail system, various trim profiles, and a 10-year limited warranty. Cost of a 5/4x6 plank in a 16-ft. length is about \$2.50 per lin. ft. **TimberTech;** 800-307-7780; www.timbertech.com

GeoDeck comes in 5/4x6 square, 5/4x6 tongue-and-groove, and 2x8 planks in 12-ft., 16-ft., and 20-ft. lengths. It can be fastened with stainless-steel nails or screws or with hidden fasteners. Available in three colors, GeoDeck has an accompanying handrail system and a 20-year limited warranty. Cost of a 5/4x6 plank is about \$2.25 per lin. ft. **Kadant Composites Inc.;** 877-804-0137; www.geodeck.com

EverGrain, made from compression-molded polyethylene, has unique wood graining. It comes in 5/4x6, 2x4, and 2x6 planks in various lengths; 2x4 and 2x6 planks will span 20 in. o.c. EverGrain comes in four colors and has a railing system that includes composite post sleeves, caps, and a 1/2-in. by 12-in. skirtboard. Fasten it with nails, screws, or hidden fasteners. EverGrain has a 10-year limited warranty. Cost of a 5/4x6 plank is around \$2 per lin. ft. **Epoch Composite Products Inc.;** 800-405-0546; www.evergrain.com

WeatherBest decking comes in 5/4x6 planks in 12-ft., 16-ft., and 20-ft. lengths in four colors. A matching handrail system and a 1/2-in. by 6-in. trim board are available. Stainless-steel screws are recommended for fastening. WeatherBest comes with a transferable 10-year limited warranty. Cost is about \$2.25 per lin. ft. **Louisiana-Pacific Corp.;** 888-820-0325; www.weatherbest.com

Trex comes in 5/4x6 and 2x4 planks in seven colors, and 2x6 planks in five colors. The decking is available in 12-ft., 16-ft., and 20-ft. lengths. Trex has a handrail system along with a handrail-installation jig. Nails, screws, or hidden fasteners can be used with Trex, which is made from 97% recycled material and comes with a limited 25-year transferable warranty. Cost is between \$2 and \$3 per lin. ft., depending on style and color. **Trex Co. Inc.;** 800-289-8739; www.trex.com

ACCESSORIES HELP YOU DECIDE

POLYPROPYLENE-BASED

CrossTimbers comes in two styles of 5/4x6 planks: square and grooved edges. The decking is available in 12-ft., 16-ft., and 20-ft. lengths in five colors. Products include a matching handrail system with 1/2-in. by 6-in. trim board. Stainless-steel screws are recommended for square-edged decking; the grooved plank accommodates hidden fasteners. CrossTimbers has a 25-year limited warranty. Cost of a 5/4x6 square-edged plank is about \$2 per lin. ft. **Elk Composite Building Products Inc.**; 866-322-7452; <http://composites.elkcorp.com>

CorrectDeck comes in two styles of 5/4x6 planks: square and grooved edges. The decking is available in 12-ft., 16-ft., and 20-ft. lengths in four colors. A matching handrail system and a 3/8-in. by 1 1/4-in. trim board are available. Stainless-steel screws are recommended for square-edged decking; the grooved plank accommodates special Correct-Ty hidden fasteners. CorrectDeck has a 25-year limited warranty. Cost of a 5/4x6 square-edged plank is about \$2 per lin. ft. **Correct Building Products LLC**; 877-332-5877; www.correctdeck.com



WOOD-FREE PLASTICS

Bear Board, 100% recycled HDPE decking, comes in 5/4x6, 2x4, and 2x6 planks in 6-ft., 8-ft., 12-ft., and 16-ft. lengths in seven colors. Because HDPE is flexible, joists for 5/4x6 must be spaced 12 in. o.c. (16 in. o.c. is OK for 2x6). Other profiles are available. Fasten with stainless-steel or coated deck screws. Bear Board has a 50-year limited warranty. Cost of 5/4x6 decking is \$1.89 per lin. ft. **Engineered Plastic Systems**; 847-462-9001; www.epsplasticlumber.com

Deck Lok, 100% PVC tongue-and-groove decking, comes in 2x6 planks in 12-ft., 16-ft., 20-ft., and 24-ft. lengths in four colors. A complete handrail system and trim profiles are available. Stainless-steel screws are recommended for fastening. Deck Lok has a limited lifetime warranty and sells for around \$3 per lin. ft. **Royal Crown Ltd.**; 800-365-3625; www.decklok.com

Eon, made from 100% polystyrene plastic, comes in 1 1/4-in. by 5 1/2-in. planks in six colors in 12-ft., 16-ft., and 20-ft. lengths. It contains no recycled material. A matching handrail system, bullnose deck board, and fascia also are available. Eon can be fastened with supplied hidden fasteners and galvanized #8 by 2-in. screws. Eon has a 25-year limited warranty. Cost of the product is about \$2.50 per lin. ft. **CPI Plastics Group Ltd.**; 866-342-5366; www.eonoutdoor.com

Procell PVC decking comes in 5/4x6 planks in 12-ft., 16-ft., and 20-ft. lengths. The product comes in four colors with a convincing woodlike appearance. The manufacturer claims that Procell contains no harmful chemicals. Fasten it with stainless-steel or coated deck screws; predrilling is not required. Procell has a limited lifetime warranty. Cost is nearly \$3 per lin. ft. **Procell Decking Systems**; 251-943-2916; www.procelldecking.com



DECK FASTENERS: Appearance matters



EB-TY



CORRECT-TY



TIGER CLAW

If you've just forked over a bundle for your new deck, you might not want to pepper the surface with thousands of nails or screws. But if you must, at least use a color-coated stainless-steel screw such as Headcote (800-596-7747; www.headcote.com) or TreapEase (800-518-3569; www.fastenmaster.com). Otherwise, consider the clean look of hidden fasteners. Eb-Ty fasteners (800-438-3289; www.ebty.com), which slip into a biscuit slot, work with many brands of synthetic decking. Correct-Ty fasteners, made by Eb-Ty, are one of several hidden fasteners matched to a brand of synthetic decking; they're made for CorrectDeck, a denser polypropylene decking that is hard to screw into without predrilling. Tiger Claw (800-928-4437; www.deckfastener.com), a barbed stainless-steel fastener, requires no special tools and pierces the edge of decking before fastening.



sand uses" throughout the '20s, '30s, and '40s.

PVC (polyvinyl chloride) followed around 1930, then polyethylene and polypropylene in 1939 and 1954, respectively. Do they hold up? As plastics, these products have proven track records. High-density polyethylene (HDPE) has been used successfully for milk and detergent containers for years. Low-density polyethylene (LDPE) is used in plastic films, bags, and squeezable plastic containers. High-density polypropylene (HDPP), a versatile plastic, is denser, stronger, and lighter than polyethylene and is used to make flowerpots, patio furniture, and sealable containers. Polyvinyl chloride (PVC), better known as vinyl, is used to make scores of products we use every day, including decking.

Wood-plastic composites dominate the market

The fact that wood loves moisture and plastic doesn't has presented problems for manufacturers interested in creating composite decking. Beyond that, the high temperatures needed to process some plastics can damage wood fibers.

In the summer of 1992, Trex launched the synthetic-decking industry by introducing a new composite-decking product that overcame these problems. Trex combined recycled polyethylene, which has a lower melting point, with wood fiber. The wood decreases the plastic's thermal expansion while increasing its strength. The plastic, which wraps around the wood fibers, reduces moisture contact with the wood.

Although this wood-plastic mix seemed like a win-win situation, there were complaints of defects and mold. A class-action lawsuit eventually was brought against Trex, but it was settled

with no admission of wrongdoing on the company's part. Trex remains an industry leader with a new generation of low-maintenance products available.

Other manufacturers experimented with polypropylene, PVC (used by window companies), and polystyrene. Although proprietary blends are closely held secrets, wood-plastic coupling agents, light stabilizers, pigments, lubricants, and fungicides are added to improve processing and product performance.

For now, most manufacturers extrude (or force through a die) the composite mixture to create deck boards. Injection and compression molding are becoming more common, though. In these processes, the molten wood-plastic mixture takes shape in precision molds. Because the material isn't milled to final shape, there's no exposed wood fiber; the decking has a denser, polymer-rich surface that resists moisture. Extruded products tend to absorb more water, which may lead to greater incidence of mold on the surface.

Wood-free plastics on the rise

They are now a small segment of the market, but wood-free synthetic products, including decking made largely from polyethylene (Bear Board), polypropylene, polystyrene, and PVC (Procell), have several distinct advantages over WPCs. Because these products don't include wood, problems associated with moisture, both in manufacturing and in use, don't exist.

Plastic decking made from 100% HDPE and HDPP is about 2 times heavier than wood and is far less stiff. It's not suitable for structural applications, but it's strong enough for decking.

Rigid PVC-decking products are made mostly of plastic, but they're still composites. The

material is less prone to thermal expansion and incorporates glass, carbon, bast (such as flax), or aramid fibers (such as Kevlar) as reinforcement.

Constantly under refinement, wood-free plastics hold the promise of higher durability and performance in lighter weights than WPCs. All-plastic products can be reinforced with glass or carbon rods to create true structural materials. According to Norris Bohm, an executive with Norwell Plastics, structural members for outdoor applications such as decks eventually will make their way to the market. The real question is how much they will cost.

How green is it?

Purchasing decking made from recycled materials is a way to remove plastic from the waste stream and to reduce the amount of petroleum used to create plastics of all types. But the amount of recycled plastic used to make synthetic decking varies greatly. For example, Engineered Plastic Systems decking (Bear Board) typically uses 100% recycled polyethylene, while CrossTimbers decking has 0% recycled plastic.

Polyethylene (the most commonly used plastic) and polypropylene are both easy to recycle. Alex Wilson, editor of *Environmental Building News*, says that "polyethylene and polypropylene are fairly 'clean' plastics that contain only hydrogen and carbon atoms. When burned, there's a near 100% conversion to water vapor and carbon dioxide."

Many PVC products, on the other hand, are tough to recycle, so they tend not to be. In addition, they give off dioxin, a potent carcinogen, when burned. □

Chris Green is an assistant editor at *Fine Homebuilding*. Photos by Scott Phillips, except where noted.

Is synthetic decking right for you?

PROS

- Synthetic decking is durable; it won't rot, crack, or peel.
- No maintenance beyond cleaning is required.
- It can be installed with ordinary power tools.
- There's no waste from material defects.
- Some products are made from recycled materials.
- Most composite decking is nontoxic.
- It's available in a variety of colors.
- Matching handrails and accessories are available.

CONS

- Synthetic decking is 2 to 5 times the cost of pressure-treated wood.
- It doesn't look as good as new wood decking.
- Special fasteners sometimes are required.
- High temperatures can cause wood-plastic composites to become more flexible.
- Wood-plastic composites are nearly 2 times heavier than wood.
- Availability varies considerably throughout the country.