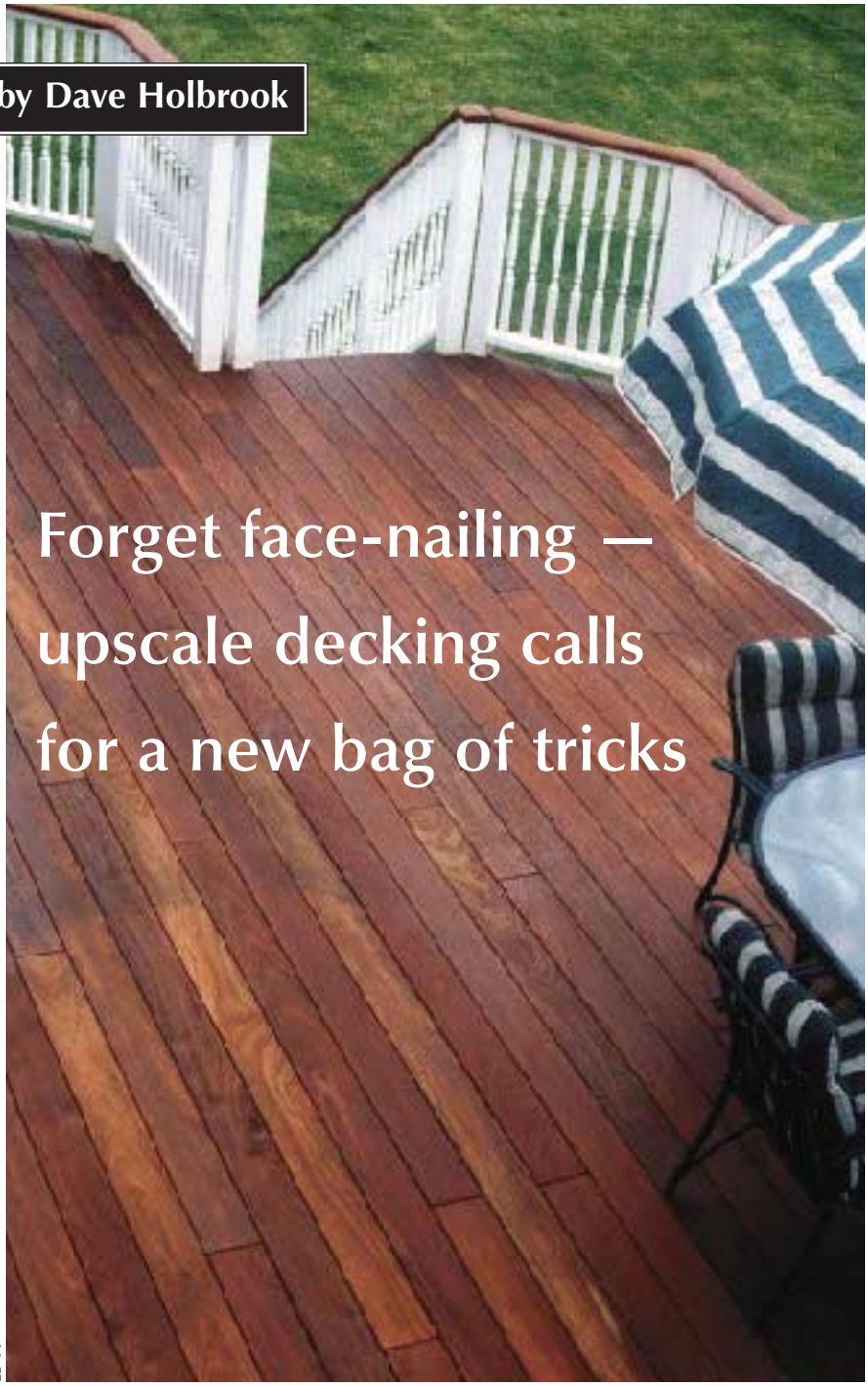
HIDDEN
Deck Fasteners

by Dave Holbrook



Forget face-nailing — upscale decking calls for a new bag of tricks

EB-TY

Aside from the fact that many people don't like to see them, visible deck fasteners invite problems. Splitting at board ends, corrosion and rust-stains, and water penetration leading to rot can all be blamed on face-nailing. Plus, nail pops and loose boards create unsafe conditions. So what's the best way to fasten a deck surface without making a feature of the nails or screws?

Hidden deck fasteners reduce or eliminate the visual and physical defects of face nailing by fastening the decking boards at their edge or underside. Whether you're using an expensive tropical wood or ordinary pressure-treated pine, a nail-free surface simply makes a nicer-looking job. Keep in mind that the following systems, although they vary in method, all cost more and take more time to install than a conventionally fastened deck surface.

Starting and Finishing

Most hardware systems fasten the decking by its edges, though a couple work from the bottom. All concealed fasteners share a minor quandary: How do you start the first board, whether the deck abuts a building or is open-sided, without showing any fasteners? You don't, exactly. The easy answer, whether they work from the edge or from underneath, is to drive and set finish nails through the face of the starter board, then fill the holes with colored putty. Or, you can cut matching wood plugs to cap recessed screws.

You can't use a hidden fastener at the outer edge of the last decking board, either. A face-nail or screw must be used here as well. Another option is to toe-nail the outer edge of the decking to the frame and cap the deck's perimeter with a trim board.

DBTC

Simpson's newly redesigned *DBTC* (Deck Board Tie — Concealed) looks promising. The tie is intended for 2-by and 5/4 softwood or wood-composite decking and is installed using a proprietary tool.

A disposable polypropylene tool, good for about 100 fasteners, is needed to drive the sharp-edged DBTC home. At 20¢ per clip, this is one of the least expensive systems available.

To install the tie, you fasten the outer edge of the first deck board by conventional means, then position the installation tool with the DBTC against the board and over the joist. Striking the disposable polypropylene tool's face with a hammer drives the clip's sharp dual prongs into the board's edge. The tool is intended to last for about 100 fasteners. (It's currently undergoing a slight redesign to beef up the grip, according to the manufacturer). You secure the tie to the top of the joist with a single #7x1 1/4-inch corrosion-resistant deck screw, purchased separately.

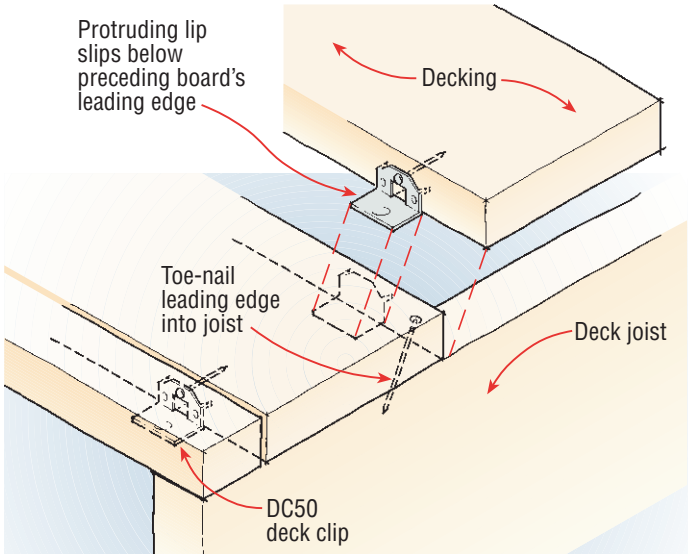
To create even board spacing, you have to use a temporary 3/16-inch spacer at each joist between subsequent boards. The force of driving the tie into the open side of the next board drives the board's back edge onto the two exposed prongs of the preceding DBTC. Make sure the board remains in solid contact with the joist by standing on it as you drive it into position — no portion of the tie separates the decking from the joist. Nothing extra is called for at butt-joints; a single tie can span the seam. A two-person team could develop an efficient installation rhythm with the DBTC, with one installer driving the ties and the other running the screwgun.

Butt joints pose a challenge to some fastening systems. A single DBTC fastener simply spans the joint.

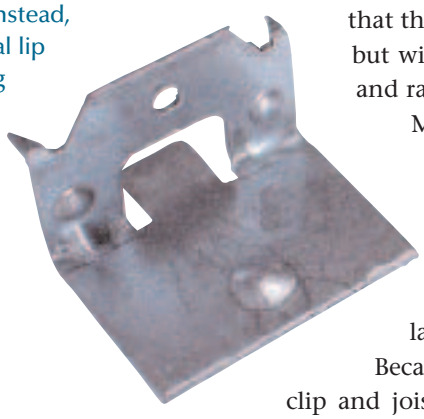
The sharp-edged 18-gauge steel tie is available in a triple zinc coating or may be special-ordered in stainless-steel for projects on or near salt water. For $20, the DBTC comes in boxes of 100 with an installation tool. You'll need about two ties per square foot of 16-inch joist centers, 5/4 or 2x4 deck surface.

Deck Clip — DC50 series

The instructions for this clip tell you to "Fasten the first deck board onto the joists by toe-nailing up through the joist below into the deck board. Be sure no sharp points protrude above the deck surface." Well, I suppose that's one way to do it, but not the way I would. To attach subsequent deck boards, you nail DC50s onto the inside board edge, positioned 2 inches to one side of each joist. Move the deck board into position, sliding the DC50's lip under the previously laid deck board. There's no connection between clip and joist; you toe-nail the deck boards' outside, or leading, edge to the joist.



The DC50 is the only edge clip that doesn't provide a direct decking-to-joist connection. Instead, the clip's protruding metal lip slips below the preceding board's leading edge, off-set from the joist, preventing uplift at the inside edge of the next deck board.



The concept behind this clip is to make square-edge lumber behave like tongue-and-groove stock. By jamming the protruding metal lip under the preceding board's toe-nailed edge, the inside, or back, edge of the board is held down (see the illustration at left). Perhaps more accurately put, the clipped edge resists uplift. A source at the company (see "Fastener Manufacturers," page 6) informed me that most people go back and screw the deck down after five or six years of service. (He added that the DC50 has been around for about ten years.) It isn't that the deck boards are in any danger of coming up, but with lumber shrinkage comes a slight looseness and rattling underfoot.

Made for lumber that is a minimum 1 1/8 inch thick — which may rule out a lot of so-called 5/4 stock — the DC50 has a pair of raised dimples that provide uniform spacing between boards, but you can also ignore them and adjust the gap for irregular board widths.

Because there is no direct connection between the clip and joist, the decking rests directly on the framing. This makes it feasible to use a good, exterior-grade subfloor adhesive under the decking to compensate for the eventual "loose" effect. But you take that approach at your own risk.

The DC50 comes in boxes of 50 for $9.20 (about 18¢ each) making this the least expensive system available. You'll need 2.5 clips per square foot of decking.

Dec-Klip

The Dec-Klip has a bi-directional base that elevates the decking board and encourages complete air-drying by eliminating direct contact with the joist.

The Dec-Klip measures 2x1x7/8 inch overall. The 7/8-inch height makes the clip unsuitable for decking thinner than 5/4, assuming minimum 1-inch-thick stock. To install the electroplated galvanized-steel Dec-Klip, you toe-nail a 10d galvanized box nail through the clip's upright neck into the edge of the decking board and the joist below. There's an elongated slot in the clip to accommodate the angled nail.

The approximately 3/32-inch-thick clip has a bi-directional tongue that rests on the joist underneath the deck board. This tongue elevates the decking board above the joist and encourages complete air-drying by eliminating direct contact with the joist. (You shim the first board level using a flat washer of equal thickness to the tongue.) The tongue fastens to the top of the joist with an 8d box nail. The manufacturer suggests using #6 drywall screws as an alternative to the 8d nail, but this is a suggestion I'd avoid. Brittle, rust-prone drywall screws are suited to one purpose only, and there are some good, durable deck screws available now.

A 7/16-inch-long, sharp prong projects from the neck of the installed clip. The next deck board is forced onto the prong, either by driving the board with a heavy maul (remembering to protect the board's edge with a scrap of wood), or by using a specialized levering tool known as a BoWrench (Cepco Tool; 800/466-9626).

Whichever way you move the board into position, it's important to keep the weight of your body on the board to avoid misalignment. The prong is the only connection holding the far, or blind, edge of the decking down in place. The manufacturer admits that hard lumber species such as Ipe can be a real challenge, so you may want to consider using a different system when working with hardwoods.

The 3/32-inch-thick neck of the clip establishes the gap between boards. Such a narrow gap may not be adequate for lumber that swells when wetted. Perhaps a greater concern is shrinkage; when typically wet pressure-treated lumber dries out, the gap could become wide enough to release the 7/16-inch prong. For this reason, the manufacturer's literature warns that your decking lumber should be fairly dry before installation.

Butt joints. Because two clips can't share a single joist location, you should use the longest lumber available to reduce the incidence of butt joints. Where joints do occur, you'll need to sister a length of framing material onto the joist to support the clip for the continuing board. Randomly sistered joists may not look so good from the underside of an elevated deck.

The literature states that you'll need about 2.53 clips per square foot on a deck with 16-inch joist centers and 3 1/2-inch-wide decking. A box of 200 clips costs $50, or 25¢ each. The price drops to 20¢ per clip for purchases of six or more boxes. A 16x24, 384-square-foot deck would require five boxes of clips.

Deckmaster

The Deckmaster track is attached to alternating sides of each joist before fastening it to the decking. Deck boards are connected by reaching underneath and screwing upward through the perforated flange.

This bottom-fastening 22-inch-long, T-section bracket attaches to alternating sides of each joist with the provided #8x1-inch screws. The top flange flares out to catch the decking before doubling back to rest on the joist's edge, creating a small gap between decking and joist.

There are 23 joist and deck screws combined per track-length, which translates to 12.5 screws per linear foot of track installed. That's a lot of screwing and, when working with dense, hard decking material, possibly predrilling, too. The included screws do have self-drilling tips. The manufacturer suggests preparing the top of the track — which comes in galvanized- or stainless-steel — with black spray-paint to reduce its metallic glare between deck boards on sunny days.

To calculate the number of brackets needed, multiply the linear footage of the deck joists by 12 and divide by 22. On 16-inch joist spacing, you'll need 2.5 brackets per 25 square feet of deck surface. A case of 100 galvanized brackets and all necessary screws costs $251; that works out to about 25¢ per square foot. Stainless steel brackets cost $451 per 100. Because the track is fastened to the joists first, you'll want to plan the occurrence of butted decking seams ahead in order to provide fastening at both sides of the joint.

Aside from the labor intensity, which is likely to offset the lower cost per square foot of the hardware, it's hard to see what could go wrong with this system.

Eb-ty

Designed to take advantage of the biscuit-joiner, the versatile Eb-Ty can be used with softwood, hardwood, and composite lumber of any thickness. Adhesive is recommended to prevent squeaks.

Clever in its versatile simplicity, the Eb-Ty makes it possible to prepare the decking boards ahead of installation. Your main weapon is a biscuit joiner or slot-cutting router, used to cut a slot in both edges of the deck board at the specific joist spacing. The Eb-Ty connector is a UV-resistant polypropylene biscuit with a 3/32-inch-thick raised auto-spacing tab at its center and an elongated screw-hole in the middle. Because of its thin, low profile, you can use the Eb-Ty with 1x decking material. After inserting the connector in the slot, a #7 stainless-steel finishing screw, driven through the biscuit and board edge at a 45-degree angle, holds the decking in place. You may have to predrill hard lumber species before installing the screws. Each successive board, prepared with mating slots, is tapped into place over the exposed half of the biscuit connector, and the sequence is repeated.

Unlike some of the other connectors mentioned thus far, the Eb-Ty puts the deck board in direct contact with the joist. This manufacturer recommends the additional use of an exterior-grade flooring adhesive in conjunction with their fastener to offset the possibility of squeaks and rattles, apparently a legitimate concern with edge fastening systems.

Butt joints. A single Eb-Ty connector can be installed across a butt joint by cutting the slot in place on the center of the joint. Common biscuits may also be used to align butt joints of slightly differing thickness before installing the Eb-Ty.

I like this system, because you're cutting, rather than punching, the edge slots, ensuring that the lumber won't surprise you later by splitting around the fastener. It also isn't limited for use with softer wood species and thicker profiles. But, it requires the patient focus of a cabinetmaker to make sure that the slots are all properly aligned and cut. And because you have to prepare both edges, you're handling each piece of lumber a lot.

The Eb-Ty is relatively expensive, at 44¢ each, including the stainless screws. You'll need 2.75 fasteners per square foot on 3 1/2-inch-wide decking over 16-inch on-center framing.

Shadoe Track

Another bottom fastener, the steel Shadoe Track employs a continuous-angle track that is first nailed along the top edge of each joist. The decking is then screwed to it from below. Shadoe Track's profile is relatively flat, with a small, 90-degree bend that registers against the joist's edge. The track fastens to the joist using galvanized spiral or annular-ring nails. Deck boards are installed one at a time and secured with screws by kneeling on the deck board and reaching underneath to drive the screws. If you've got one, a right-angle screwgun will provide an ergonomic advantage here.

The shallow profile of the Shadoe Track registers against the edge of the joist. Annular-ring nails fasten the track to the top edge of each joist (above). A right-angle screw gun helps ease the pain of upside-down screwing (right). If you're lucky, you'll be able to work from below.

It's said that once you acclimate to an upside-down position, the throbbing blood pressure in your head equalizes, but I believe you'll find out for yourself after peering under the decking at your 3000th screw. If you're lucky, you'll be able to work from below, with the aid of a helper or a clamp to hold the board down.

The manufacturer calls for 9 nails and 52 screws per 8-foot length of track. Shadoe Track is available in 20-gauge galvanized-, beige powder-coat-, or stainless-steel, in 4- and 8-foot lengths. Four-foot lengths cost $4 to $5 each; 8-foot track lengths range in price between $7 and $8 each; drill-point screws and annular-ring nails are available at additional cost.

Stealth Decking Fasteners

Deck One's promotional literature claims that the Stealth Decking Fastener installs as fast as traditional nailing. In reality, traditional nailing installs as fast as traditional nailing — clips are somewhat slower. The high-tensile-steel clip is galvanized after it's punched and formed.

After face-nailing the starter board, you hammer the clip's two-way, dual prongs into the leading edge with the aid of a proprietary punch. The Stealth's base is then nailed to the face of the joist, after which you lay the next board in place. You drive the board onto the projecting prongs with a hammer or maul, keeping one foot on the board to prevent it from riding up.

You have to use a special punch to drive the Stealth Fastener (left). The Stealth nails to the face of the joist, protecting its top edge from damage (above, right). The clip's neck establishes a regular 3/16-inch space between boards. The clip's base has been slightly redesigned for manufacturing efficiency (above, left).

To promote drying, this clip has a pair of tabs that slip under the deck board and elevate it from the top of the joist. Because the base of the clip nails to the face of the joist rather than the top edge, the chance of water penetrating the top of the joist around the nail's shank is eliminated. A face connection also means that you can use a clip on both sides of the same joist at butt joints, eliminating the need to sister lumber on.

Successive boards are driven onto the projecting prongs, using anything from your usual hammer to a ten-pound sledge, depending on the type and density of the deck-lumber you're laying. The prongs on the fastener are short, measuring no more than 7/16 inch. The manufacturer claims that withdrawal due to lumber shrinkage is unheard of. However, I'd still want to make sure that my deck lumber was as dry, and therefore as small as it would ever be in service. Best bet: If using pressure-treated lumber, make sure it's kiln-dried after treatment.

The Stealth is self-gapping, providing a 3/16-inch-wide space between boards. I think this wider gap is a better bet than the 3/32-inch gap imposed by other clips, in the event that wetted deck lumber needs a little room to expand. A self-gapping system, though, can also spell trouble if your decking isn't all of a uniform width, something pressure-treated lumber is notorious for.

Stealth Decking Fasteners cost 24¢ to 26¢ each, and you'll need an average of two per square foot of 3 1/2-inch-wide decking on 16-inch joist spacing. Add a few extra clips for butt-joints.

Fastener Manufacturers

BEN Manufacturing
425/776-5340
www.premier1.net/~ben69
Dec-Klip

Blue Heron Enterprises
888/438-3289
www.ebty.com
Eb-ty

Grabber Construction Products
800/869-1375
www.deckmaster.com
Deckmaster

Simpson Strong-Tie
800/899-5099
www.strongtie.com
DBTC

Spotnails
800/873-2239
www.spotnails.com
Tebo

Deck One
888/335-3217
www.deckone.com
Stealth Decking Fastener

TY-LAN Enterprises
800/742-3632
www.shadoetrack.com
Shadoe Track

USP Lumber Connectors
800/328-5934
www.uspconnectors.com
Deck Clip — DC50 series

Tebo

The oddly shaped Tebo connector stacks in a special driving tool for rapid-fire installation that rivals face-nailing for speed.

Tebo's connector looks like an unused stainless-steel staple, with a third leg projecting from the crown at a 45-degree angle. The Tebo has little in common with other edge-fastening systems. And it's the only system that's likely to challenge the speed of traditional nailing. A $300 proprietary tool — essentially an upright, mallet-driven flooring nailer — is used to install the Tebo connector. The connectors aren't collated, which could make tool-loading tedious, but installation is fast and simple. A mallet blow simultaneously drives the connector into the joist and the edge of the decking at a 45-degree angle. The third spur on the Tebo connector sticks out at 90 degrees to the edge, ready to spear the back edge of the next board in line. The installer drives the board onto these spurs, working down the length of the board with a heavy maul (using a beater-board to protect the decking edge from hammer dents). There's some body English involved, using the balls of your feet to hold the board down while you sledge it into position.

The Tebo fastener can be used as a self-gapping system — the shank is a skinny 1/8 inch at its widest section — but with softer decking materials like redwood and cedar, you could have problems. The use of temporary gapping shims, such as tapered cedar shingles, is advised to maintain even spacing between boards. Because the connecting spur is only 9/16 inch long, though, you have to be careful not to make the gap between the boards too wide.

The Tebo connector is designed on the assumption that most installers work from left to right. According to the manufacturer, installation is awkward but manageable for left-handed people.

To fasten deck boards at butt joints, Tebo connectors may be driven into either face of the joist into each respective butt end. However, a Tebo connector driven from the left side of the joist will have to have its spur manually bent over after installation in order to project at a 90-degree angle. Alternatively, that spur may be hammered over flat to get it out of the way.

The Tebo system can be used to install decking on the diagonal, but you'll need to bend the prong back to 90 degrees to the decking edge after installation, using a proprietary tool.

Although the manufacturer is working on an alternative inverted point that will cut into dense, tropical lumber, at the present time, hardwood like Ipe spells trouble for the system. Unless, that is, you want to use Tebo's optional pilot hole drill fixture.

Also, pressure-treated lumber, if not kiln-dried after treatment, may be too wet for these connectors to be effective. Excessive shrinkage could allow the board to pull free of the connecting spur. The connectors come in boxes of 120 for $50, or about 42¢ each.

Choosing the Right Fastener

Dimensional irregularities in lumber spell trouble with the self-spacing systems. It's not unusual, especially with treated yellow pine, to find discrepancies in board width as great as 1/4 inch. Depending on the surfacing material you plan to work with, you may want to choose a system that allows you to customize the board spacing.

Moisture in lumber can also be a problem, particularly with edge-fastening systems. Too-wet lumber, installed in a sunny location, can undergo a radical transformation in a matter of days. Warping and shrinkage may exceed the tolerances of some edge-clip systems. It's best to determine that the lumber you're using is at the ideal moisture content for your region, before installation ("Wood Facts & Fictions," 12/99). To minimize the likelihood of problems, avoid wet or unseasoned lumber when building a deck, regardless of the fastening system used. If you think warping or cupping problems are likely, a bottom-fastening system may be your best option.

Whichever system you choose, don't be misled by claims that there's no labor penalty involved. I'd set aside any benchmark deck installation numbers you have and think through the steps involved in the system of choice. New methods call for new numbers. And, the decision to conceal the fasteners indicates an intention to raise the quality, and thus the cost, of the deck job.

Dave Holbrook *is an associate editor for* The Journal of Light Construction, *following a 20-year career as a builder on outer Cape Cod, Mass.*