Deck Railings Grow Up

Stainless steel, vinyl, aluminum, and composites are now viable alternatives to wood

BY SCOTT GIBSON

Trex started a stampede of new building materials in the 1990s with the introduction of an alternative decking made from wood flour and recycled plastic. Many other manufacturers since have introduced their own composites, and low-maintenance decking options have grown to include a variety of plastics and metal. Yet the development of matching railings lagged behind. Now that's changing, too.

Wood still accounts for as much as 80% of all residential deck railings. But a number of other choices offer the same advantages that are behind the steady rise of composite decking: resistance to insects and decay, weather hardiness, and the need for very little maintenance.

Of these low-maintenance options, wood/plastic composite railings make up a fast-growing category, but there's also aluminum-reinforced vinyl, stainless-steel cable, cellular polyvinyl chloride (PVC), molded polyurethane, and powder-coated metal. Even on the low end, wood alternatives are more expensive. PVC railings are often the most affordable, and they can be three or four times as expensive as a pressure-treated rail. At the other end of the scale, molded urethane can top $150 per running ft. for the heaviest, most elaborate styles.

Newer rail systems, however, are often easier and faster to install. At their most basic, lumberlike composite railings assemble the same way as the wood they are displacing. But producers have devised special clips, brackets, and templates to speed up the job. Some rail comes packaged in 6-ft. or 8-ft. ready-to-assemble kits that manufacturers say can be installed in minutes per foot.

"The more consumers are getting educated to new railings … the more they want them," says Steve Scholl, a busy deck builder in the Detroit metro area. None of this will ever satisfy anyone who wants real wood, but to a generation with an increasing aversion to maintenance, it's very appealing.

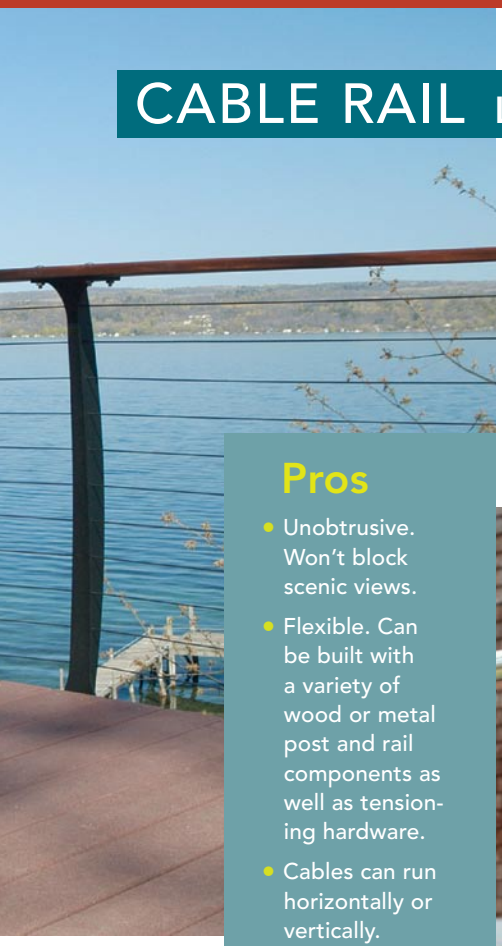
Scott Gibson is a contributing editor who lives in East Waterboro, Maine. Photos by Krysta S. Doerfler, except where noted.

CABLE RAIL LESS IS MORE

Cable rail is one railing alternative that doesn't look like wood. It's made from the same kind of wire and hardware used for sailboat rigging, and it won't block a million-dollar view.

Stainless-steel cable is typically ⅛ in. dia. for residential railings and heavier for commercial applications. The most common (and one of the strongest) is 1x19, made up of 19 individual strands of wire.

Cable railing is moderately expensive, starting at $65 to $75 per running ft. for an all-metal horizontal installation but about half of that cost when cable and fittings are combined with wood posts and top rails. Both surface-mounted and through-post cable terminations (below) are available; turnbuckles allow the cable to be tightened as needed. Keeping railing turns to a minimum will reduce hardware and installation costs.

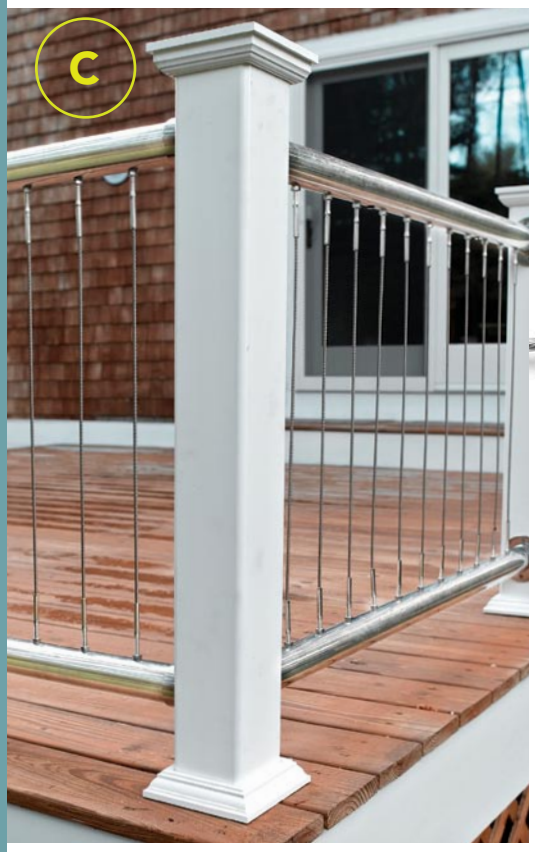


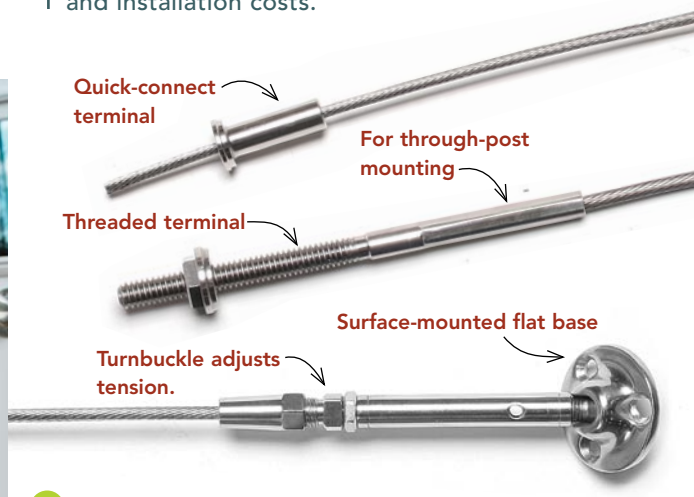
Pros

- Unobtrusive. Won't block scenic views.
- Flexible. Can be built with a variety of wood or metal post and rail components as well as tensioning hardware.
- Cables can run horizontally or vertically.
- Glass panels can be used in some aluminum-rail systems.

Cons

- More expensive than some other options.
- Horizontal railings barred in some areas because they pose a "climbing hazard."
- Not compatible with all architectural styles.





A **Strong and transparent.** Custom steel posts and stainless-steel cable open the views to this lakeside deck. The posts were fabricated and designed by Keuka Studios in Honeoye Falls, N.Y. Cable assembly by Feeney.

B **Cable rail can be surface-mounted.** If you use wood, corner posts have to be sturdy. Producers usually recommend a 4x4 at minimum because the 11 cables typical for a 36-in.-high rail exert a great deal of lateral force. Railing by Atlantis.

C **There's an upcharge for a different look.** Vertical installations require beefy top and bottom rails as well as more cable terminations and labor. Railing by Atlantis.

What the code says about railings

The International Residential Code is straightforward about railings on residential decks. However, some areas are more restrictive than others in their interpretation. For example, although not prohibited by the IRC, some local inspectors won't allow horizontal installations; critics claim that the railing presents a ladder structure that's not child-proof. It's a good idea to check with your code-enforcement officer before you build. In a nutshell:

- **No part of the railing can allow passage of a 4-in.-dia. ball.**
- **Any deck more than 30 in. off the ground needs a guardrail.**
- **Residential railings must be at least 36 in. high (commercial railings, 42 in. high).**
- **Railings must withstand 200 lb. of lateral force.**

Photos left and above: Courtesy of Atlantis Railing Systems. Photo above left: Scott Gibson.

METAL OLD-WORLD LOOK WITH A FRIENDLY PRICE

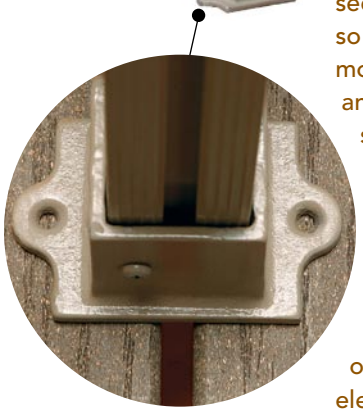
There is no mistaking powder-coated aluminum and steel railings for something else. These railings are not trying to look like any material other than metal.

Given the strength of metal parts, baluster and post styles tend to be thinner and less massive than other alternatives. Metal also is a versatile material that can be fabricated into many styles, from plain to ornately detailed filigree, as in the example from Anderson Welding (photo above).

Producers point to speedy installation as another advantage. Rail sections arrive already assembled so that the installer only has to mount the posts, cut rails to length, and attach them. Post-to-post spans of 10 ft. are possible without any intermediate supports.

Aluminum, iron, and steel railings may look the same, but it might be best to stay away from ferrous metals in saltwater areas. Although powder-coating offers good protection from the elements, even a pinhole can allow moisture below the paint film, where it will cause rust.

Basic aluminum railings are typically more expensive than vinyl but not as costly as many composites. Expect to pay about $35 to $40 per running ft.



Don't let the corrosion start. When bolting metal posts to the deck, use nylon washers to prevent cracking the powder coating on the mounting flange. Railing above by L&L Railings.

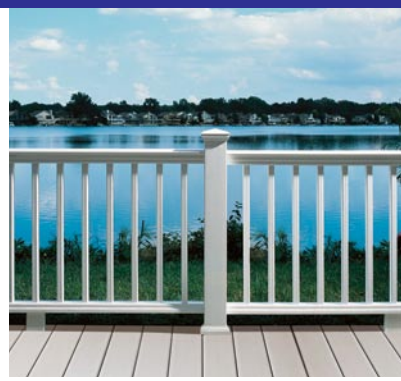
Pros

- Quick installation.
- High strength and long unsupported spans.
- Material highly adaptable to custom shapes.
- Very low maintenance.

Cons

- Appearance may not be appropriate with some architectural styles.
- Railings made from ferrous metals can rust if finish is damaged.

VINYL A VERY LONG-LASTING



Polyvinyl chloride is a widely used plastic that has become standard in everything from siding to window and door frames as well as deck railings. Vinyl is supposed to look like freshly painted wood, but as producers like CertainTeed (photo right) are fond of saying, it doesn't have any of the maintenance problems that go along with wood. Vinyl doesn't rot or warp, never needs paint, and is unaffected by insects.

Now in very wide use even on upscale houses, vinyl has done a lot to shed its image as a cheap building material. Alcoa, for example, guarantees its vinyl railing for as long as you own the house. Yet some homeowners complain that vinyl railings can be squeaky when flexed.

Vinyl railing tends to be one of the least-expensive wood alternatives and should be available for about $20 to $25 per running ft.

Posts are still wood. Many railing systems come with a post sleeve that fits over the 4x4, as in this Alcoa railing; the railings are attached through the sleeve into the post. Vinyl sleeves tend to be thinner-walled than composite sleeves.

Photo top left: Rob Anderson. Photo top right: Courtesy of CertainTeed.

PAINT JOB

Hidden mechanicals. Rail/post connections typically are made with the help of metal brackets that are screwed through the post sleeve into the wood beneath; some models' brackets are hidden by a trim cover, as in this Genova railing.

Pros

- Durable; very low maintenance.
- Longer unsupported rail spans than wood-plastic composites.
- Has the appearance of painted wood.
- Railing comes in kits that can be assembled quickly.

Cons

- It's still plastic, which won't appeal to all homeowners.
- Limited color selection.
- Some consider the manufacturing process environmentally hazardous.

Metal bones. Vinyl-rail sections typically are reinforced with aluminum or steel for added stiffness, like the Royal Crown Ltd. railing to the right. The result is a span of up to 10 ft.—and that's without any support blocks beneath the lower rail.

SHOP NOTES

by John White

As *Fine Homebuilding*'s shop manager, I assembled the sample railings the manufacturers sent to us for the photos in this article. Below are some of my observations.

The **manufacturer's instructions** are often poorly written and/or misleading. I'm experienced in building railings, so I was able to muddle through. Less experienced builders might have a harder time, though. It's a good idea to check the manufacturers' Web sites for a preview of installation guides before buying the product.

If **irregular baluster spacing** drives you crazy, then think long and hard about the type of railing you buy and the post spacing on your deck. Any railing system that has predetermined baluster spacing (Trex, Genova, Eon, etc.) must be installed with post locations that correspond to the length of the railings (6 ft. on center, for example), or the baluster spacing on each side of the post will be difficult to match.

In high winds, **noisy railing systems** can be a problem. Balusters that drop into precut holes in the rails can rattle when disturbed.

Many of the **post sleeves** are made slightly oversize to fit easily over potentially twisted wood posts. Because the sleeve material is often thin, it will deform when the railing sections are attached if it's not shimmed.

COMPOSITES A NEW LIFE FOR WOOD CHIPS AND PLASTIC BAGS

Composites are a recycling success story, keeping millions of pounds of plastics per year out of landfills. Although they still make up a small slice of the deck and railing business, composite producers are elbowing their way into the market in increasing numbers.

Composites are fairly flexible—polyethylene products like Trex more so than polypropylene composites—so bottom rails must be supported by squash blocks as frequently as every 18 in. so that they don't droop.

A newer type of composite (photo below right) is capped with a layer of PVC in a process that is called co-extrusion. This process gives the railing the look of a painted finish that, like solid-PVC railings, is nonporous and is not as susceptible to fading.

Composites are available as dimensional lumber that can be used to make railings conventionally or as kits that are designed to go together more quickly. Costs start at about $45 per running ft.

Pros

- Appears more wood-like than other low-maintenance options, so railings blend nicely with wood-composite decking.
- Feels more like wood than plastic railings.
- Wider color selection than vinyl.
- Unlike wood, won't split, crack, or warp.
- Trex railings can be ordered in curved sections.

Cons

- Relatively expensive.
- Because wood composites contain organic material, they can support the growth of mold.
- With the exception of the PVC-coated variety, dark colors can fade in sunlight. Effect varies by brand.
- Requires support blocks under bottom rail to prevent sagging.

When it comes to assembly, site-built rails offer more options. Composite railings like the Alcoa Oasis shown above are made from solid, lumberlike stock A and are built the same way as wood railings. Railing kits such as Trex's co-extruded Artisan are made of preregistered and precut parts B. They may be faster to assemble, but their design isn't as flexible in terms of baluster spacing, railing height, and other design options.

Photos this page: Charles Bickford

THE OTHER PLASTICS VARIATIONS ON A THEME

Pricey elegance. Molded-urethane railings are made by Fypon, which produces a line of well-known trim under the same trade name; it is the most expensive railing option I found. Prices go above $150 per running ft. for large-scale railings and oversize balusters with the proportions of carved stone. But the look is unlike just about anything else (photo left). Styles can be very ornate, better-suited to period homes than the more limited offerings in vinyl or wood composite. Rail widths range from 5 in. to 12 in.

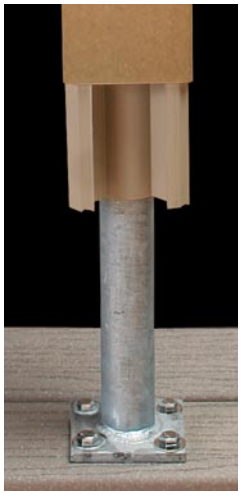
Urethane railing components, which are reinforced with PVC pipe (photo right), are available in straight and curved sections. Newel posts also are reinforced with PVC pipe. Railings can span up to 12 ft. between posts (10 ft. for the 5-in. system) with squash blocks required below the bottom rail every 4 ft. to 5 ft. Fypon arrives primed and can be painted. It won't absorb water, crack, or rot.

As strong as aluminum. Fiberglass railings made by Armor-Rail (photo right) are similar in composition to a fiberglass ladder and, the manufacturer says, have about the same strength as aluminum. They are made with "pultruded" fiberglass, a process in which continuous glass strands are pulled through a die.

Posts are hollow in section with walls about ¼ in. thick. They can be installed over a 4x4 or mounted over a proprietary support (photo left) that's bolted to the deck framing.

Rail sections come completely assembled. The maximum distance between posts is 12 ft., with one squash block below the bottom rail. There are several rail and baluster styles and four colors to choose from. These railings cost more than vinyl but not as much as some composites.

Foam and wood. Cellular PVC is a type of plastic foam that is molded into different profiles for railing parts. It's made by several companies and typically is reinforced with another material to meet code requirements for strength. Novaline's Wood Collection railings use a composite higher than most in wood-fiber content plus cellular PVC. Novaline's hollow posts can be installed on 4x4s or over their steel-tube stanchion (photo right). The railing is in about the same price range as wood composites.



Rail sources

CABLE RAILING

Cable Rail by Feeney
www.cablerail.com

Ultra-Tec
www.ultra-tec.com

Atlantis Rail Systems
www.atlantisrail.com

Secosouth
www.secosouth.com

METAL

Anderson Welding & Sons LLC
www.steelandironwork.com

L & L Railings
www.llrailings.com

Fortress Iron Railing
www.fortressiron.com

VINYL

CertainTeed
www.certainteed.com

Genova
www.genovaproducts.com

Alcoa
www.alcoa.com/alcoahomes

Royal Crown Limited
www.royalcrownltd.com

COMPOSITE

Trex
www.trex.com

Timber Tech
www.timbertech.com

CertainTeed
www.certainteed.com

Correct Deck
www.correctdeck.com

Latitudes
www.latitudesdeck.com

Alcoa/Oasis
www.alcoa.com/alcoahomes

OTHER PLASTICS

Armor-Rail
www.armor-rail.com

Gossen
www.gossenmouldings.com

Harmony Select Railings
www.royalcrownltd.com

Novaline
www.rdirail.com

Fypon
www.fypon.com

Eon
www.eonoutdoor.com