

Installing Laminate Flooring

by Robert B. Ruhl

Things happen slowly in the world of flooring. The last revolution in floor coverings was the invention of linoleum in 1860. However, with the advent of high-pressure melamine laminate flooring in 1977, the industry's pace quickened to a fast gallop. Originally developed in Sweden by the Perstorp Corporation, laminate flooring was introduced to the U.S. market in 1994. I'd been a flooring contractor for over 25 years, and



Glue makes laminate flooring work. A special PVA-type glue bonds and permanently seals the surface. The edge-glued flooring floats on the existing subfloor.

What is laminate flooring?

Laminate flooring owes its impervious nature to a bulletproof, layered construction (drawing below). The tongue-and-groove flooring can be installed in any area of the house, including bathrooms. (Most manufacturers do recommend sealing the floor's perimeter with silicone caulk in areas likely to have standing water.) Available in 8-in. wide planks, 15-in. squares or 15-in. by 25-in. blocks, the laminate's cost ranges between \$3.50 and \$5 per sq. ft. There are an increasing number of manufacturers jumping on the bandwagon, so be sure to talk to a few retailers and installers before making a purchase.—R. B. R.



Typical laminate-flooring construction

Clear melamine impregnated with aluminum oxide protects the floor.

Design layer is similar to countertop material.

Resilient, stable core of high-density fiberboard

Melamine layer blocks moisture absorption.

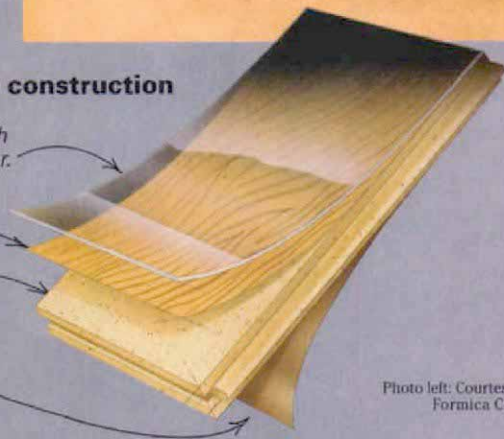


Photo left: Courtesy of Formica Corp.

Laminate's beauty is skin deep. The technology of phototransfer allows laminate manufacturers to provide customers with an almost infinite variety of designs in laminate flooring, from realistic wood grains to faux marble and stone to parquet and floral patterns.

this flooring material seemed to be the answer to all homeowners' complaints regarding other types of flooring: It didn't wear out, it wouldn't stain or fade, and it was relatively easy to install. After working with laminate flooring for the past four years, I've developed an installation technique that is based on the manufacturers' specifications and my own experience.

First, estimate the area of the floor, then acclimate the flooring—To estimate the amount of flooring that I need, I measure each area to be covered, rounding up the measurements to the nearest 6 in. After I find the square footage, I add the total areas and add 5% for waste, then divide the total by the number of square feet contained in one box of flooring. For a diagonal installation, I add 15% to the total, square footage.

Once I've bought the flooring, I move the product to the job site at least 48 hours prior to the installation to acclimate. I stack the boxes indoors near a wall in the installation area. It's important to keep the boxes sealed and in the house. I make sure that my crew handles the boxes carefully, too: If a box is dropped, the edges of the fragile laminate flooring can be easily chipped or broken.

You need a clean, flat subfloor before you begin—Laminate flooring and its specialized underlayment can be installed over any existing flooring except padded carpet. Because laminate floors float on the subfloor (they're not glued, nailed or otherwise fastened to the subfloor), the preparation requirements are surprisingly forgiving. The subfloor has to be clean, sound and relatively flat. When I'm installing laminate flooring over vinyl floors, I cut away any curled vinyl seams or edges around doorways. Ceramic tiles must be secure; a few tiles can be reglued, but I'm wary of a failing ceramic job that should be completely removed. When installing laminate over a concrete slab, I lay down a layer of 6-mil poly that serves as a moisture barrier.

After thoroughly vacuuming the floor, I use a chalkline or a 6-ft. straightedge to check the flatness of the floor (photo top left, p. 84). Any deflection less than $\frac{1}{4}$ in. over 10 ft. is perfectly acceptable. I ignore any holes or depressions smaller than 3 in.; larger holes can be filled with any variety of floor-leveling compounds. To smooth out larger uneven areas, the fill material needs only to lie flat and be noncompressible. I like to use 30-lb, roofing felt; it's inexpensive, easy to build up incremental layers quickly and easy to clean up.

My last preparation is to rid the floor of squeaks by nailing the subfloor down at the joists with twist-shank 7d flooring nails. Home-

Installation



Make sure that the existing floor is flat. After it is cleaned, the floor must be checked for flatness with a straightedge or a chalkline. Any floor deflection of $\frac{1}{4}$ in. or less over 10 ft. is acceptable.



To conceal the expansion gap, the door trim must be undercut with a jamb saw. To hide the necessary $\frac{1}{4}$ in. expansion gap in places that can't be covered with shoe molding, installers use a special circular saw to cut the door trim at a precise height (photo left). These specialty saws (photo right) have no base plate, and instead bear on the flattened edge of the blade guard. Both the blade's height and cutting depth are adjustable.

owners really appreciate this, and it takes only a few minutes.

Undercutting door jambs hides the gap required for the floor's expansion—Because laminate moves in response to seasonal fluctuations in temperature and humidity, you must allow for an expansion gap of $\frac{1}{4}$ in. around the floor's perimeter. Along walls and cabinets, I cover this gap with shoe molding or vinyl cove base, but where the flooring meets a doorway, I have to cut the door jamb at the height of the flooring (photo above center) and run the floor under the trim. I cut the door jambs with a specialized circular saw called a jamb saw (Crane Cutter Co., 156 S. Milpitas Blvd., Milpitas, CA 95035-5459; 408-946-6100) (photo above right) and check my cut with a piece of flooring and underlayment (photo top left, facing page); the jamb saw makes a clean, square cut. You can also use a handsaw with an offset handle; a piece of the flooring used as a shim under the blade will raise the saw to the proper height.

Layout means dry-fitting starter courses first—The layout of the first two courses of tile is important. Laminate flooring is manufactured to close tolerances to ensure tight joints. The first courses must be tight and straight; loose joints in the course will be amplified later.

I usually start the first courses of tiles on a long wall and measure the room carefully. If there is a small fraction (less than 3 in.) of a tile at the end of a course, I try to make the first and last tiles



equal in size for appearance's sake. The next step is to check the straightness of the wall with a chalkline. Any wall deviation greater than $\frac{1}{4}$ in. means that I have to scribe the first course to fit along the wall.

After I've figured the run of the tiles, I stack them up and put down the underlayment,

which provides the necessary cushion for the flooring. Here, there are two basic choices: low-density fiber panel, which measures approximately $\frac{1}{4}$ in. thick, 24 in. wide and 30 in. long; or closed-cell foam, $\frac{1}{8}$ in. thick, which comes in 100-sq. ft. rolls. On an installation over a concrete slab, I use the fiber panels because they



Checking the fit. After cutting the door trim and removing the waste with a hammer and chisel, installers make sure that the laminate flooring and underlayment will fit neatly into the space.



Dry-fitting the first two rows. It's important to make cuts and check the fit of the laminate before gluing. Numbering the back of the laminate helps to keep the pieces in sequence. This is also a good time to check for defects.

Laminate cuts easily with a cordless saw

Sergio Landeo uses a cordless saw outfitted with a carbide blade to cut the flooring. The saw's lower rpm's allow safer cuts and throw less dust into the work area, so he doesn't have to walk outside every time he has to make a cut. Any tearout or chipping can be covered by the shoe molding.



flooring and numbering the laminate with a pencil as I go. A cordless saw with a 20-tooth carbide blade does a good job of cutting the laminate (photo left). I use plastic spacers, which are available from flooring retailers, between the wall and the laminate to maintain the proper gap. As I go down the row, I make sure that the joints are tight and that the laminate is running straight. If the installation is over a finished floor, I often use the old floor's pattern as a reference; otherwise, I snap a chalkline to keep the course straight.

Accurate glue application is critical for long-lasting, water-resistant joints—Properly glued joints are what makes this flooring work, so good glue technique is important. Because each manufacturer makes its own brand of PVA-type glue and lists special instructions for proper glue application, it's important to follow the manufacturer's instructions. In all installations, the glue bead must ooze to the surface along the entire length of the seam without interruption. This continuous glue bond ensures a water-resistant surface.

For the Wilsonart project featured in this article, I used a gluing method that I've found is both easy and foolproof. I begin by cutting off the tip of the applicator just enough to expose a slot or hole $\frac{1}{8}$ in. wide. Holding the panel upright, I apply a thin, continuous bead to the bottom of the groove (photo p. 82), then apply a thin bead to the top of the tongue of the panel on the floor. Angling the glue bottle lets me ap-

reduce noise and because they provide better thermal insulation. The fiber panels also absorb little lumps and bumps in the old floor, such as old glue ridges.

After establishing a straight edge, I visually inspect each tile for defects and start to dry-fit the first two courses (photo above right), cutting the

Float appliances on a cushion of air

Appliances are always tough to move gracefully, especially over a new floor. I use a tool called an Airsled; this labor saver spares back muscles and new floors at the same time. I slip the neoprene-coated pad under the appliance, turn on the blower that's slung over my shoulder and waltz the fridge into place. These slick machines cost between \$300 and \$500, but they can often be rented from a rental center. —R. B. R.



**Airsled Inc., 70-A Aleph Drive,
Newark, DE 19702; 800-247-7533;
www.airsled.com**

Glue up



Glue is critical to the flooring's success. Holding the glue bottle at a slight angle is an easy way to control the application of glue. A second bead along the mating tile's edge ensures a tight, waterproof bond. Gaps in the glue line can cause the flooring to fail.



Wipe off excess glue and check the joint. A plastic putty knife makes a good tool to clean excess glue off the flooring. Follow with a damp, not wet, terry-cloth towel; too much water in the towel will dilute the glue and weaken the joint.



A few careful taps with a hammer and block can close gaps. One way to tighten flooring joints is to use a hammer and a plastic tapping block, which is made to fit the flooring's edges. However, tapping too hard can dislodge other joints.

ply the glue in a smooth line. I fit the groove into the mating tongue and push it tightly into place. At this point, the glue must ooze up on the surface of the floor in a continuous bead (photo right); if there are gaps, I pull the panels apart and add a little glue to those spots.

As I go, I squeegee the excess glue from the surface with a 2-in. plastic putty knife (photo above center), wipe with a rough terry-cloth towel (smooth rags don't work) and check the tightness of the joint. The towel should be damp, not wet; I don't want to dilute the glue. I wring the excess water out of the towel and rinse often. As I glue the first double course, I check the joints with a dry panel across the joint. If the joint is not perfectly aligned and tight, a couple of taps with a block and hammer (photo above right) usually do the trick.

After a few tiles, I like to ensure a good joint by using strap clamps (photo left, facing page). These special flooring clamps are expensive (\$60 to \$75 each) but necessary when I'm installing laminate tiles over a concrete floor; I can draw several joints together with a few ratchets of the clamp. Using dry panels as cauls, I clamp the panels in both directions at the same time and leave the clamps on for a few minutes. Once the joints have been compressed, they will stay tight. I avoid overtightening the clamps; they might suddenly buckle and chip the laminate.

Clean the residual glue and finish preparations—When the starter courses are finished, I make sure all the glue and residue is off the



tiles (photo right, facing page). It's important to clean up the glue as you go; if you wait, it becomes more difficult to clean. I inspect the joints when cleaning, too. If a joint is loose, now is the time to tighten it with clamps or blocks.

With the starter course complete, it's a good idea to let the glue set up for 20 minutes to an

hour. I usually go back and finish preparing the rest of the room. Once the prep work is done, I can begin laying the rest of the tiles, using the same procedures.

It's important to note that the area that can be covered in one run of flooring is limited. Adjacent areas separated by a doorway or pas-



Strap clamps keep joints tight, courses straight. All laminate flooring requires some clamping to tighten glue joints. Specialized clamps can apply pressure over spans of up to 15 ft. or more. As long as the joints are tight, the tile edges will align themselves.



Window cleaner and a towel clean glue haze. After the clamps have been removed, the residual glue haze must be cleaned off before it dries completely. A 1:5 solution of vinegar and water works just as well as the window cleaner.

Installation tips for a plank floor

Installing laminate planks requires a few different techniques than those that are used for tiles. To reduce the visibility of the joints, I install planks to run parallel to incoming natural light; in artificial light, I place them along the longest wall.



Stagger plank joints when establishing the starter course. When laying plank floors, always build a starter course of three rows, staggering the butt joints by at least the width of the plank. Specialized bar clamps draw the glue joints together.

Consistent glue squeeze-out is the first indication of a successful glueline

After firmly pushing the glued tiles together, the author makes sure there's an even amount of glue squeeze-out. Little or no squeeze-out may indicate a dry area; if necessary, he pulls the tiles apart and reglues.

ommend a maximum area of approximately 1,000 sq. ft.

After the glue sets up, life returns to normal—Once the laminate is laid up and the glue has set, I cut and install a full-size shoe molding (at least ½ in. by ¾ in.), nailing it to the baseboard, never to the floor. Next, I install thresholds or transition moldings, making sure the laminate can move under the strip and that the threshold is fastened to the adjoining floor. If anything needs to be fastened directly through the laminate floor, I make sure that the hole drilled is larger than the shank of the fastener; this allows the floor to move independently.

Also, before installing shoe molding near the refrigerator, I caulk the space between the floor and baseboard with silicone and set the shoe in the wet caulk. If the refrigerator leaks, the leak won't run under the shoe and swell the edge of the laminate. I use the same principle when dealing with dishwashers by first bedding the flooring in silicone caulk, then placing a bead of caulk to the exposed edge and wiping it down in contact with the floor. Drilling a ½-in. hole through the subfloor just below the water feed will, I hope, divert leaks into the basement or the floor below the kitchen. I think it's less costly to patch a ceiling than to replace a floor. □

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I lay out the starter course dry, starting with a full plank and running the first row; I use a ¼-in. spacer at the end and every foot or so along the wall. When I get to the last plank, I measure ¼ in. short of the wall, cut the plank and start the second row with the cutoff, which must be at least as long as the width of a plank, or about 8 in. I run the second and third rows, disassemble the rows and begin to glue.

I apply enough glue to the tongues and grooves of the first three rows and fit them together tightly. Next, I put a clamp at each end of the panels and use slight pressure to compress the joints (photo above). I glue and install the next three panels to the right in the same sequence as before, clamping as I go. I continue to the wall, cleaning off the excess glue, inspecting the joints carefully and adjusting the clamps as needed to hold the finished three rows tight. I use strap clamps to tighten the butt joints. I allow the assembly to set for 30 minutes to an hour while I prepare the rest of the floor.—R. B. R.

sage less than 4 ft. wide (bedrooms that are off a hallway, for instance) must be separated by a transition strip or T-molding, which will allow independent movement of the areas. I check with the individual manufacturers for the maximum area that can be covered without using an expansion joint; some manufacturers rec-