

Laminate Countertops On Site

by Michael J. Barnes



With a few basic tools and techniques, you can produce professional-quality plastic laminate counters at the job site

Contractors who rely on specialty shops to supply all of their countertops may regard laminate work as too difficult, too time-consuming, or too expensive to be done on site. But the skills required to work with plastic laminates are no more sophisticated than those you employ on any finish project: an ability to measure and cut accurately, and a willingness to fuss over 32nds of an inch.

Tools

The only new tools you might have to purchase are a very inexpensive router, a laminate flush trim bit, and a few hand tools.

Light-duty router. For laminate work, you must be able to handle the router easily with one hand. If the only router you own is a 3-hp plunge model weighing 12 pounds, I suggest you buy the lightest-weight, lightest-duty router you can find. This may be the only opportunity you'll ever have to buy a truly cheap piece of equipment and feel good about it — light weight and small size are the only attributes that matter.

I recommend an all-plastic router with no fancy geared adjustment, no

light, no slick adjustable handles, and practically no horsepower. We're talking \$29.95 here. The tool freaks among you are probably asking, "Why not just buy a laminate trimmer and get it over with?" The main reason is they cost about four times as much as an inexpensive router. Unless you're going into production on countertops, you're only going to be routing laminate for about five minutes per month. At that rate, the additional cost of the trimmer may not make sense.

Trim bit. The flush trim bit you'll need is available in a variety of diameters and lengths. I recommend a 1/2-inch-diameter bit that's 1/2 inch long. Exposing more than 1/2 inch of cutting edge below the router base is very risky when trimming laminate, so bits longer than 1/2 inch are just not that useful.

Hand tools. Occasionally you will encounter an awkward inside corner where a router just won't fit. A hacksaw blade will cut the laminate without chipping — it's not much fun, but it works. For routed edges that didn't turn out perfectly flush, use a machinist's all-purpose file.

All of the big cabinet shops apply the contact cement with a spray gun,

but I've never tried it, and it's not at the top of my "must do" list. For small jobs, I use a cheap 2-inch or 3-inch brush. On jobs larger than a few square feet, a short-nap 9-inch roller spreads the cement easily and uniformly. For edges, a 1 1/2-inch brush works well. You can leave the brush in the can with the cement, rather than allowing it to harden between jobs, but only if it has a wooden handle (the cement will attack a plastic handle).

To ensure complete adhesion between the laminate and the particleboard substrate, wonderful hardwood and rubber rollers are available in the catalogs. But I find that tapping a palm-sized block of wood with a hammer works just fine.

That's about it for tools, except for hearing protection and a good full-face shield. This kind of work requires you to get very intimate with the router, and at close range it can be a thoroughly nasty device. Those "granny glasses" you've been calling eye protection are just not going to be adequate.

Materials

I build all of my substrates with

very fine-grained 3/4-inch particleboard. Every manufacturer has a different name for this stuff, but virtually all of them offer it in an oversized sheet (49x97 inches) specifically for making countertops. The smoother the sheet, the easier it is to rout the edges of the laminate facings and endcaps. A smooth surface also makes for a more uniform bond to the laminate. Don't use coarse "underlayment" grades of particleboard, and avoid plywood, which is neither dimensionally stable enough nor smooth enough for use in countertops. Multi-purpose screws or drywall screws, along with plenty of wood glue, work well for fastening the various layers of substrate together.

Laminate is produced in sheets up to 5x12 feet, and in every texture and color imaginable. The major brands are uniformly excellent; some lesser-known brands suffer from uneven quality. Most good yards stock the most popular colors of one or two brands, and will order whatever you need. For a countertop, make sure you're working with standard grade laminate. Vertical grade, which is made specifically for door and drawer fronts, is too thin and brittle

(although it might do for the back-splash).

If you live in a state or locality with strict air-quality regulations and fire codes, you might not be able to buy really great contact cement. The old solvent-based type does an excellent job of what the boys in the hills call "adhesing," but it has a few undeniable drawbacks, not the least of which is its amazing flammability. In fact, contact cement is what they use in the movies when a character staggers from a burning building with his clothes afire. On top of its flammability, the fumes from contact cement are both explosive and toxic. Nice stuff.

Luckily, there are some "user-friendly" alternatives. One of these is a solvent-based cement similar to the original formula, but lacking the explosively flammable drying agents. The tradeoff is that it takes somewhat longer to dry. The other alternative is a latex acrylic cement that requires both higher ambient temperatures and long drying times. These cements still produce fumes that the manufacturers warn against breathing, so make a serious effort to ventilate your workspace.

Substrate Construction

I prefer to build countertops after the base cabinets are in, but before the wall units are hung. That way I can get precise measurements of the installed bases and still be able to tip in large, tight-fitting countertops without interference from wall-mounted units above.

Your workspace should be at least partially heated and free of other tradespeople. If you are providing heat with an open-flame heater, reread the previous section and make a sane decision about which kind of adhesive to use.

The substrate consists of two layers: a top layer made up of the largest pieces possible, and a bottom layer of edge buildup bands, joint stiffeners, and cleats to support the top at every vertical divider of the cabinets below (see Figure 1). This produces a top that is a standard 1 1/2 inches thick, and is easily strong enough to span dishwasher and trash compactor openings in the base cabinets.

Whether you use a table saw or a portable circular saw to cut parts for substrates, the saw *must* be capable of turning out a true 90-degree edge. Because the flush trim bit in the router can work perfectly only on a true 90-degree edge, even minor inaccuracies in your saw cut can cause disasters in the routing. Angles less than 90 degrees cause the bit to leave the top piece of laminate hanging over the face piece, a problem that can only be corrected by intensive hand work with a file. Angles greater than 90 degrees cause the bit to cut into the face piece — definitely a mood-altering experience.

There are only a few rules for

substrate design. First, this is not a good place to use up a lot of scrap underlayment. Try to use the fewest number of pieces possible to make the top layer — a single piece is ideal. On an L shape, make sure that the entire corner is cut from one sheet. Joints at or near the corner make the top too weak to move safely. If joints in the substrate are necessary, locate them away from sink openings, and in places where joints in the laminate will miss them by a foot or two.

Secondly, every vertical divider in the base cabinets should have a corresponding cleat in the countertop. Also, make sure that buildup bands at the front edge and ends are absolutely flush with the edge of the top — otherwise, routing the laminate will be a nightmare.

Finally, avoid using screws near the sink cutout. Since all edging and cleats should be glued, you can remove any screws you use as clamps in this area after the glue has dried.

Rough-Cutting Laminate Sheets

The first time you try doing your own laminate work, rough-cut all the pieces with a full 1/2-inch overhang on each edge. After you gain more confidence, you can reduce the overhang to 1/4 inch or even 1/8 inch. It's a lot easier to trim a 1/8-inch overhang than a 1/2-inch overhang, but it makes sense to give yourself a little room for error in positioning the sheet for gluing.

Using a table saw. If you have a table saw on site, you can cut even the largest sheets cleanly after making a few minor modifications to the saw. Clamp a straight strip of scrap particleboard or other material to the fence to close the gap between the bottom of the fence and the saw bed. Otherwise, the sheet will try to slip under the fence, spoiling both the cut and your day.

Plastic laminate can chip if you're not careful when you cut it. Use a veneer or plywood blade, or any blade with at least 5 tips-per-inch. This should keep the worst chips down to about 1/16 inch to 3/32 inch — easily within the margin you will be trimming off with the router. If you need a completely chip-free cut, raise the blade higher than normal to provide a more vertical angle of attack for the saw teeth.

Handling large, floppy, brittle sheets of laminate can be challenging. I like to loosely roll the sheet, and slowly unroll it as I feed it into the saw (Figure 2). If space is tight, your helper can reroll the sheet on the outfeed end of the saw.

Using a circular saw. It's possible to rip laminate with a portable circular saw. The main difficulty is keeping the sheet flat and stable while you hack away at it. If you're blessed with ample working space, the substrate, blocked-up on sawhorses, makes a fair workbench.

Joints

Making clean joints in the surface laminate requires cutting both sheets at the same time with the router. A simple jig made of scrap particleboard makes this process nearly foolproof (Figure 3, next page).

Marking. First draw a line on the substrate, indicating exactly where the joint will occur. Continue the

line down the face and back edge — you'll need it later to accurately position the sheets for gluing. Next, place one of the surface laminate sheets to be joined on the substrate and align it precisely where it will ultimately be glued. Be sure to get all the overhangs in the right places. Now transfer the joint line from the substrate to the surface laminate.



Figure 2. When ripping a full sheet of laminate on a table saw, unroll the sheet as you feed it into the blade and have a helper roll it up again on the outfeed side. A scrap of wood clamped to the saw fence eliminates any gap between the fence and the saw table.

Substrate Details

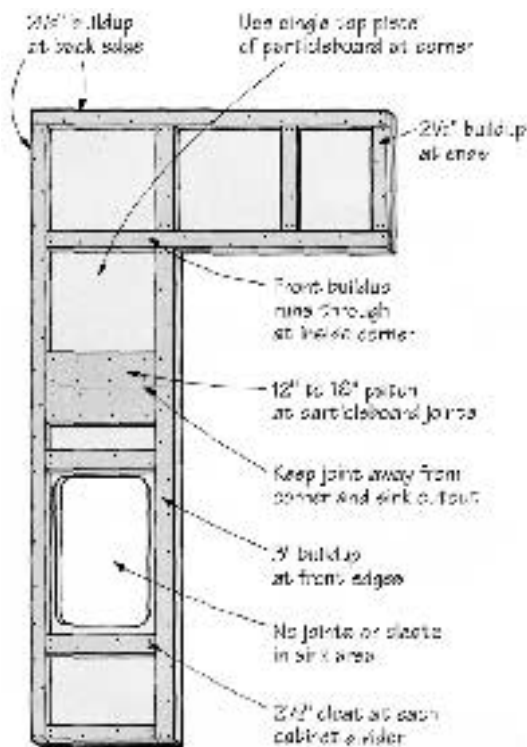


Figure 1. When making a laminate countertop substrate, avoid joints in the particleboard at corners and sink cut-outs. Where joints do occur, support them with a large patch on the substrate bottom. Build up the countertop thickness to a standard 1 1/2 inches with bands at the edges, and use cleats to support the top at each cabinet divider location.



Figure 3. When making a laminate butt joint, cut both pieces at once using a simple particleboard jig. The base of the router rides against the top left piece of particleboard, which acts as a straightedge.



Figure 4. Apply and trim laminate edges first, beginning with the ends of the countertop.



Figure 5. Place stickers 12 inches on-center to keep the surface laminate from adhering to the substrate as it is being positioned.

Finally, draw a second line parallel to and $\frac{1}{4}$ inch away from the first to mark where you'll rough crosscut the laminate. Confusion about which line is which can lead to disaster, so a penciled notation on the sheet is a good idea. Then repeat the marking process with the other sheet to be joined, and rough crosscut both sheets using a tablesaw or circular saw.

Cutting. Arrange both sheets on your jig, with the joint lines dead parallel to the jig and to each other, making sure they're exactly $\frac{1}{2}$ inch apart — the width of the router bit. Clamp everything firmly, being careful to allow room for the router to pass over the clamps. Run the router down the center of the jig, cutting both sheets simultaneously.

To be certain you've got everything right before applying adhesive, dry fit the sheets on the substrate. A few light pencil lines across the joint will help you correctly reposition the sheets in relation to each other during gluing. When you're ready to stick down the laminate, the original joint line on the substrate will show through the cement. Make sure to make contact at the joint first.

Applying Laminate

For the cleanest appearance, I prefer to install the laminate end caps first, followed by the face pieces, and then the tops. Apply two coats of contact cement to the particleboard substrate and one coat to the laminate, allowing the cement to dry between coats. Don't get too sloppy with the cement or you may gum up the router bearing later.

Everyone develops their own way of determining when the adhesive is dry enough for assembly. I figure that when the little hairs on the back of my hand stick to the glue — but my skin doesn't — the glue is dry. This seems like a good time to point out that this stuff is called "contact cement" for a reason. Once two coated surfaces touch, a nearly miraculous bond takes place, making it just about impossible to reposition the pieces. If you find you have to reposition a piece, you can continually score the glue joint with a razor blade, rolling the laminate away from the particleboard as you go, until the sheet comes free. Then you have to start over again and reapply cement. It's much easier to be careful while positioning pieces for gluing the first time.

Step by step. For end caps and facing strips, use a hardwood roller or wood block and hammer to work out any air bubbles and ensure complete adhesion. Regardless of which tool you use for this, try not to break off the overhanging edges of the laminate. When this happens, all you can do is start over with a fresh strip of laminate.

Now rout off all the overhanging edges (Figure 4). This requires some one-handed work with the router on

the short ends of the pieces, and makes you really appreciate that new lightweight router. If the top has an L shape, you'll have to use a hacksaw blade to trim the laminate for about 3 inches at the inside corner overhangs. I like to use a file on all of the edges of the facing, just to be sure that the laminate edge is truly flush on every side.

Apply the top pieces of laminate last. You can do this alone, but it's easier with a helper. The trickiest part is keeping the laminate from touching the substrate until the laminate is positioned just where you want it. I lay $\frac{1}{2}$ -inch dowels or $\frac{1}{2} \times \frac{3}{4}$ -inch stickers about 12 inches on-center between the laminate and the top (Figure 5). I've heard that strips taken from old Venetian blinds also work well. Whatever you use, make sure that the stickers are free of dust and that the cement is dry.

With the laminate positioned on the stickers, start at one end — or at a joint if there is one — and remove the stickers one at a time, firmly pressing the two surfaces together as you go. Use a sweeping motion with your hand to keep air bubbles from forming. Seat the entire surface with a roller or wood block, paying special attention to the front edge. Before routing the top piece, adjust the router to expose the absolute minimum of cutting edge on the bit. This makes it much less likely that you'll nick the face piece. On an inside corner, you will again need to use a hacksaw blade and file to trim the edge.

Final Details

Contact cement solvent will remove excess glue from the laminate surfaces, but read the label carefully and protect yourself against hostile chemicals and fumes. Inspect the finished top, looking for edges that could benefit from a little filing. No matter what, I like to use very fine sandpaper (shoe-shine style) to break the sharpness of the routed edges a little.

Some people are particularly sensitive to gases emitted by particleboard. Consider sealing the bottom of the countertop with polyurethane if you anticipate that kind of problem. At a minimum, it's good practice to seal the bottom of the countertop above the dishwasher opening, since warm, wet air can play havoc with particleboard over time.

All of this probably sounds like quite a project, but a little experience speeds things up markedly and allows you to be competitive with rates charged by specialty laminate shops for custom work. If you're the kind of finish carpenter who looks forward to a challenge and never tires of hearing "wows" from your clients, you'll really enjoy site-laminating plastics. ■

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