

BY CHUCK GREEN

SOLID SURFACE COUNTERTOPS



Using a router and pilot bit, the author smooths the seam between a Surell sink and counter. Finished edges are rounded over and sanded to a dull sheen (below).

CAREFUL PREPARATION, PRECISION CUTS, AND A COOL HEAD UNDER PRESSURE ARE THE KEYS TO SUCCESS WITH SOLID SURFACE MATERIALS



In my remodeling business, customers often ask me for “Corian” countertops. Corian, a DuPont product, was the first brand of solid surfacing introduced, and for a long time it was the only brand. But DuPont’s original patent on Corian has expired, and six different companies now make solid surfacing materials (see manufacturers list). Builders and remodelers can now offer people more choices.

Fabricating with solid surfacing isn’t too hard to learn, though the techniques vary a little from brand to brand. To use any of them, you need to get some training from the manufacturer. I’ve taken the introductory

training seminars offered for both Corian and Surell, Formica’s brand of solid surfacing, and I’ve worked with both products. In this article, I’ll go over the steps in an on-site fabrication job I recently completed using Surell. The job was a custom kitchen. Usually I make up countertops in the shop, but this time I did all the fabrication on site because of the cold weather. (My shop isn’t heated at night and wasn’t warming up to the required 70°F temperature fast enough.) The tight kitchen space complicated matters, but it also proved just how versatile and easy to use solid surfacing is.

Ordering the Material

Always stick with one company’s material and seaming compound when you use solid surfacing. Different brands aren’t compatible, and the colors won’t match. In fact, any sheets that you plan to seam together should come from the same production lot, because color varies a little from one run to the next. With Surell, the sheets are stamped on the back with “skid numbers.” Your distributor can get you sheets with the same skid number to ensure a consistent color throughout.

Sizes. Sheets come in 30- and 36-inch widths, in several lengths from 4 to 12 feet, and in 1/4-, 1/2-, and 3/4-inch



Figure 1. Modifying the stock cabinets. Solid surface counters must be well supported from underneath. To match the one-inch buildup on the front edge of the counter, the author added a continuous one-inch-thick wood strip to the top of the cabinets along the wall and crosswise at every cabinet side (left). To provide a perfectly smooth bearing, he also had to recess the cabinets' metal corner brackets (right), which protruded above the top surface of the cabinets.

thicknesses. My distributor has been willing to sell me half sheets as well. You can also get narrow strips for backsplashes, but these will come from a different skid number. I offer my customers that choice, because you save a little money that way, and the slight color variation between the backsplash and the counter usually isn't noticeable.

Cost. Sheets are expensive (around \$25 per sq. ft. for 1/2-inch stock), so plan your cutting list before you buy. When you're deciding what size sheets to order, keep in mind that joints have to be placed away from inside corners or heat sources such as cooktops. Otherwise, stresses can build up and crack the material. Also remember to order extra material for backsplashes and built-up edges.

Not all colors and sizes are instantly available, so give your distributor some advance notice. Both the Corian and Surell distributors in my area have jumped through hoops at times to get the material I've asked for, even if it meant trucking sheets in from out of state. With their help, I can usually reduce waste to a minimum.

For this job, I ended up buying two thicknesses of material, 1/2 and 3/4 inch. I used the 3/4-inch stock for the island countertop because it could handle the 12-inch cantilevers without any support. The main part of the cabinets formed an L-shape with a 1-inch overhang, and for this I used 1/2-inch-thick stock, the most common size. The 3/4-inch-thick stock is more expensive, but it's easier to build up the visible edges to 1 1/2-inch thickness,

which most customers want. With 1/2-inch stock, bonding one layer below will produce a 1-inch-thick edge, but you'll have to add a second strip for the thicker look.

Getting to Work

When I make countertops in the shop, I make cardboard templates at the site, then use them as guides in the shop. On this job, we just measured and rough-cut the pieces, then did our seaming and finish-cutting in place. This worked okay, although dust was a special challenge (see "Dust Control" below).

Modifying the cabinets. Solid surfacing must be well supported, so we had to slightly modify the stock cabinets we used. On the island, this meant recessing the metal corner brackets so they would sit flush with

the surface — a time-consuming task (Figure 1). On the cabinets along the walls, we installed a continuous 1-inch-thick cleat along the back, and crosswise supports every 18 inches, to match the thickness of the tripled-up material on the front edge.

Cutting. You can work solid surfacing with the same tools you use for woodworking: table saw, miter saw, router, power planer, and circular saw (Figure 2). All blades must be carbide-tipped. You need to be extra careful not to scratch the surface. I put nonscratching covers on some of my tools (clear packing tape works well), and I leave the solid surfacing's protective plastic in place, just pulling it aside to mark my cuts, then replacing it for the actual cutting. I spray DriCote lubricant (Bostik, Boston St., Middleton, MA 01949;

Dust Control

Surell dust is considered a "nuisance" dust — it isn't toxic, but there's a lot of it and it gets everywhere. I've seen big fabrication shops where the dust could be found in offices way down the hall from the shop itself. On our job, we sealed off the kitchen with plastic sheets and used a zippered Dust Door (Brophy Design Inc., 524 Green St., Boylston, MA 01505; 508/393-7166) in the door opening. We set up an exhaust fan to the outdoors and turned it on when we were cutting or routing. Then it was just a matter of frequent vacuuming.

A tight-fitting dust mask is important for solid surfacing work. My job foreman, Dave Deganhart, uses 3M masks with foam gaskets, but I have a full beard and can't get a good seal with any simple mask. I use the Airlite Air Visor (Airstream Dust Helmets, P.O. Box 975, Elbow Lake, MN 56531; 800/328-1792), a battery-powered unit that has a full-face mask and blows filtered air down across my face. It costs about \$230, but my lungs are worth more than that to me.

— C.G.

800/726-7845) on the table saw before each cut.

After rough-cutting each piece, you have to smooth the saw cut with a planer or router. Even with the 80-tooth carbide blades I use, no saw cut is smooth enough for a seam. Edge irregularities can cause stresses to build up and crack the material over time. My practice is to smooth each edge right after it's cut, then label the pieces and their edges so I will remember how each piece fits into the puzzle. Pieces that will be routed in place later can be left rough.

On our kitchen project, we first rough-cut the two big pieces that would make up the L, leaving $\frac{1}{2}$ -inch extra material to allow for scribing and fitting. Only the exposed end of the L needed to butt perfectly to the wall. Gaps at the back of the counter would be hidden when the backsplash was installed.

The seam where the two legs of the L met, however, had to be cut and fit with precision. To ensure a perfect match, we positioned the two pieces $\frac{3}{8}$ inch apart and ran a $\frac{1}{2}$ -inch spiral router bit down the center, using a guide for the router (Figure 3). This was a little more complicated on site, with the wall in the way, than it is in the shop. We had to rig up quite a complicated array of clamps to keep everything steady.

We set the jig up so that the router would only have to remove $\frac{1}{16}$ inch from each side of the joint. The router bit could more easily remove this small amount, and it was easy to hold the



Figure 2. Solid surfacing can be cut with standard woodworking tools equipped with carbide-tipped blades. Here, the author rips a piece of Surell on a portable table saw.

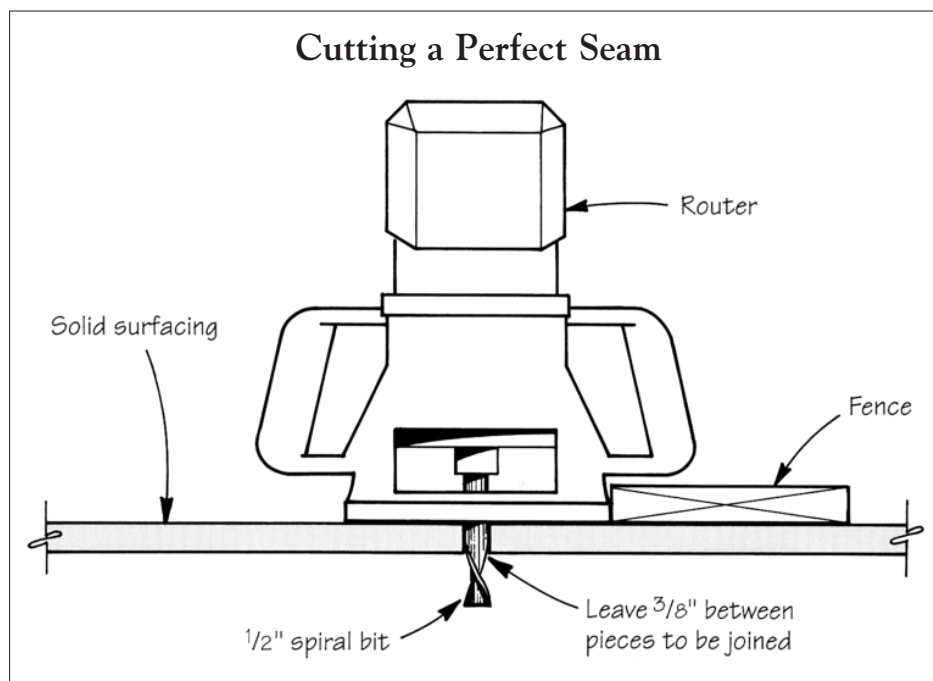


Figure 3. To cut matching edges for a seam, the author first clamps the two pieces of solid surfacing $\frac{3}{8}$ inch apart. Using a straightedge as a guide, he then runs a router with a $\frac{1}{2}$ -inch spiral bit down the center.

router to the guide. After unclamping, a test-fit showed that the seam cut was perfect.

Installing the Sink

To make things easier for ourselves, we decided to install the sink before seaming the two counter pieces together (see "Installing a Solid Surface Sink"). Seaming the sink requires flipping the countertop over several times, which is hard to do with a big, unwieldy L in a confined kitchen space.

You install sinks by joining them to the countertop with seaming compound. You can take your time with layout and preliminary cuts, but when the time comes to actually seam the sink in, you have to act fast before the compound sets up. Once it's mixed, seaming compound gives you only about eight minutes to work.

The sink was attached to the underside of the countertop sheet. After carefully laying out the sink location on both the top and bottom of the sheet (double-checking your layout is well worth it with this stuff), I roughed up both the sink lip and the area it would be joined to. Then I cut a 4-inch hole in the sheet to accept a bar clamp. The clamp would extend through the sink's drain hole to hold the two components together while the seam cured.

I like to glue maple blocks around the

sink's layout perimeter to act as guides. I tack them in place with hot-melt glue. The blocks make setting the sink in place quick and simple. The less fussing the better during those precious eight minutes. Afterwards, the blocks come loose with a hammer tap. Hardwood works best for this — softwood blocks tend to splinter instead of breaking loose cleanly.

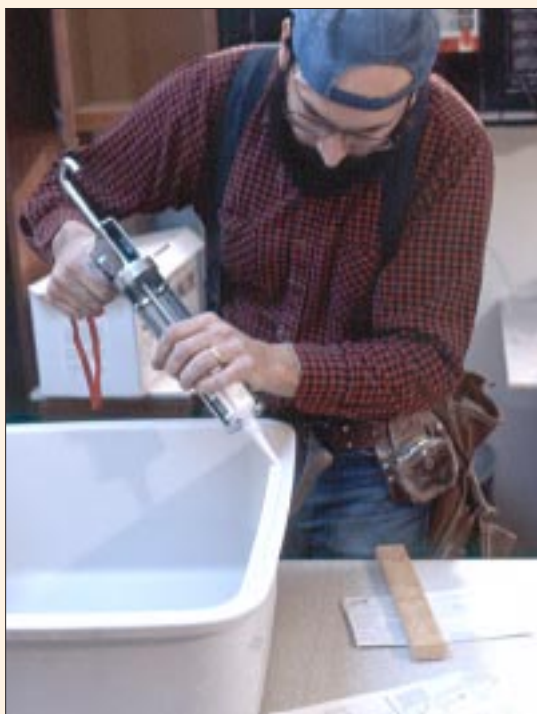
The last step before seaming is cleaning. To get a good bond, the joint has to be perfectly clean. You use denatured alcohol for this, swabbing both sides of the joint thoroughly with paper towels.

Seaming compound. Mixing and applying the seaming compound is a little tricky. Luckily, the stuff comes with directions. Surell's two-part seaming compound comes in a special cartridge with an adaptor that fits electric drills. You chuck the mixing wand into your drill, then break the seal between the two parts by pushing down the plunger. Then you mix for the specified time, and quickly put the cartridge into your caulking gun. Oh, and don't forget the adaptor for the caulking gun.

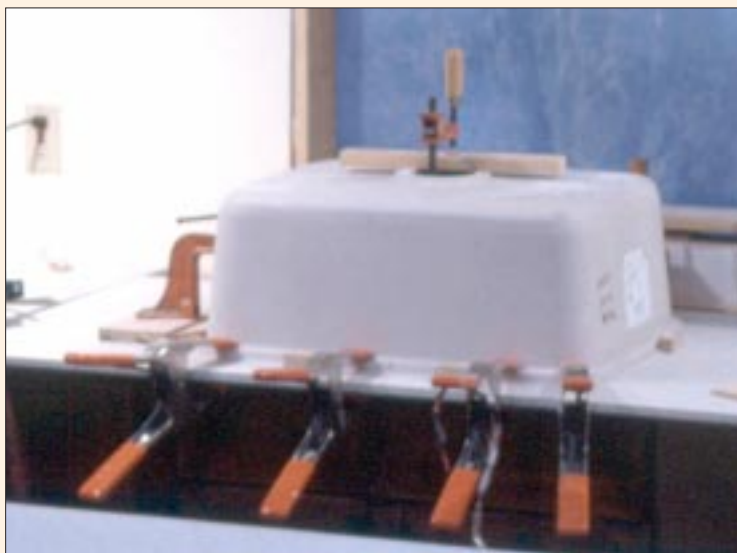
It's worth reviewing this procedure in advance each time until you get the hang of it. One misplaced item or forgotten step, and you've got big problems. There's no time to think when you're seaming.



INSTALLING A SOLID SURFACE SINK



The author outlines the sink location on the underside of the countertop (above), then attaches wood guide blocks along the line with hot-melt glue to help position the sink during the seaming process. After cleaning the surfaces to be seamed, he applies seaming compound to the lip of the sink (left) and clamps the sink into place (below).



As soon as the compound has set up, the top is flipped into place and the sink hole is cut out with a router and pilot bit (left). Wood strips hot-glued to the corners prevent the top from falling through while the cut is made. The finish pass with the router rounds over the sink edge and smooths the joint (right).

Cutting out the sink. I finished the sink cutout with two passes of a router, using bits I buy from Fred Velepec Co. (71-72 70th St., Glendale, NY 11385; 800/365-6636). The first pass was with a bit that left a 1/8-inch lip. The second was with a finishing roundover bit that makes a smooth curve and blends the countertop perfectly into the sink. A little hand sanding and we had an integrated unit with no visible seam.

Assembling the Countertop

Seaming the countertop was another case of mixing the compound, then rushing to fit and clamp the joint. Again, we made a point of preparing in advance so we could act fast when the time came.

To hold the countertop joint together, we attached a maple strip to each piece with hot-melt glue, then applied clamp pressure. Another set of clamps held the surfaces flush. Hot-melt glue came in handy again for attaching a surface-mounted clamp in the center of the joint to keep that area flush (Figure 4).

If there's a lot extra seaming compound squeezed out of the joint, don't wipe it off: You might leave voids in the glue joint that would cause cracking later. Instead, let the squeeze-out cure and remove it later with a router. This time, we had just a minor squeeze-out that we could easily sand off.

Perimeter edging. We built up the front edge of the countertop to 1 1/2 inches by seaming together three layers of 1/2-inch stock (Figure 5). We started from the inside corner and worked out, taking care to stagger the joints (aligned joints would create a weak spot in the finished piece). With clamps spaced every 3 inches along the edge of the counter, the thing looked like a clamp porcupine before we were done.

Once the edge was tripled up, it could be cut and rounded off with a bullnose router bit. For inside and outside corners, we first made templates for the router to follow, then clamped them in place. After routing the corners, we clamped a straightedge in place and routed off the straight front and sides.

Installing the Countertop

For final installation, we propped the finished countertop up on 2x6



Figure 4. The countertop joint is clamped together using strips of hardwood attached to the two pieces with hot-melt glue. A clamp screwed to a plywood block, also fastened with hot-melt glue, holds the two surfaces flush.



Figure 5. Counter edges are built up with two 1/2-inch strips of Surell, seamed together with compound and thoroughly clamped to minimize joint lines (above). Trimming with a router and straightedge yields a smooth, one-piece finish (left).



supports, being very careful in lifting not to stress the sink area, the joints, and our backs. We then applied dabs of silicone caulk every 6 inches to the upper surfaces of the cabinets, the cleats, and our reinforcing members. Silicone is the recommended fastener with solid surfacing because it flexes to allow for thermal expansion in the countertop. Finally, we carefully lowered the top into its proper location, and checked for any areas where silicone might have squeezed out onto the cabinet top rails.

We also used silicone to bond the backsplash to the countertop. The edges of the pieces had to be planed smooth as always. Then we applied a continuous bead of color-matched caulk to the bottom edge of the backsplash and dabs of silicone to the back side. Clamps and sticks wedged against the ceiling kept pressure on the joint as the silicone cured. We used wet rags to clean up any silicone

that oozed from the joint during the first few minutes.

Plumbing installation is pretty straightforward with solid surfacing. Cutouts for the plumbing are done with a router — leaving rough jigsaw cuts could cause the material to crack. Dishwasher installation can be tricky: Some dishwashers need to be secured at the top by screws into the counter, to keep the unit from tipping out when the door is open and the racks are extended. Since you can't screw directly into solid surfacing, we solve the problem by drilling an oversize hole in the underside of the countertop and setting the screws in a gob of silicone caulk in the hole. The threads don't bite into the solid material at all, so the screws don't have much withdrawal strength, but they resist the sideways pull of the dishwasher.

The island. After the complicated L-counter and sink, the island was a piece of cake. With no joints, no inside

corners, no sink and only a double thickness at the edge, this stage of the project went quickly and smoothly.

Finishing. The last step is sanding the surface. You can polish these materials to a high gloss, but it isn't recommended because it's hard to maintain and all minor irregularities show up, as with a high gloss paint on a wall. We sanded these counters to a dull sheen. Starting with 150-grit paper in an orbital sander, we progressed to 240 grit with a little water. We then hand-sanded with wet 300 grit and wet 60 micron paper.

Formica says wet sanding works best with these fine papers, but you have to watch out for the shock hazard. Air sanding equipment is the safest; at a minimum use double-insulated tools, and be sure all work outlets are equipped with a GFCI. ■

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Solid Surfacing Manufacturers

You have three choices if you want solid surface countertops: Order custom tops from a K&B shop or fabricator, who might also install them; fabricate them yourself; or buy premade tops with bowls from a lumber yard or plumbing supply store. This last route limits your selection to a smaller range of colors and styles.

Each manufacturer has an 800 number. If you call the manufacturer, they'll tell you where to find the local distributor for their brand. The distributor in turn can introduce you to fabricators in your area, or help you get certified as a fabricator yourself.

— C.G.

Avonite

Avonite Inc.
1945 S. Highway 304
Belen, NM 87002
800/428-6648

Three different product lines with different compositions. The Class III high-end line is translucent and takes a high shine but requires maintenance.

Corian

DuPont Company
Box 80702, Room 1218
Chestnut Run Plaza
Wilmington, DE 19880
800/426-7426

Five lines and three price ranges of acrylic-based material in a range of colors.

Fountainhead

Nevamar Division
International Paper
8331 Telegraph Rd.
Odenton, MD 21113
800/638-4380

A polyester-based thermoset product, available in three lines: 4 solid colors, 13 matrix styles (granites), and 6 Classix, which are like the matrix but with large particles.

Gibraltar

Ralph Wilson Plastics
1110 Industrial Blvd.
Temple, TX 76504
800/787-3223

Acrylic and polyester, available in 16 solid colors and 16 granites. Gibraltar claims greater heat resistance than other solid surface materials.

Surell

Formica Corporation
1504 Sadlier Circle
Indianapolis, IN 46239
800/367-6422

Polyester based, available in three product lines: 9 solid colors, 14 granites, and three Revolution Collection styles (the most expensive).

Swanstone

Swan Inc.
One City Center, Suite 2300
St. Louis, MO 63101
800/325-7000

A reinforced modified acrylic, available in 5 solid colors and 13 granites. Swanstone comes in 0.41-inch thickness, and claims to have greater strength than other brands. Only Swanstone has stock sinks available in the granites.