

THINSET TILE COUNTERTOPS

A longlasting and attractive job starts with precise layout and a sturdy substrate

by Brad Compton

When I install tile countertops, I want a finished product that will draw attention for the right reasons. Poor tile placement, unlevel surfaces, and cracked grout lines can make a tile job a real eyesore and open the way to water damage. From the sizing and placement of the plywood base right on through to the removal of the excess grout, many decisions are made that will make or break a tile job's appearance and durability.

Scoping Out the Job

When I arrive on a job, the first thing I do — sometimes before I unpack my truck — is grab my 2-foot level and check the cabinet installation from front to back and end to end. I often find cabinets out of level. While I can compensate for some leveling problems in a mortar-bed job, with thinset on backerboard there's not much I can do. I have to either install the backsplash out of level to match the countertop, or level the backsplash and make up the difference in the backsplash grout joint. The lesson to learn from all this is to start with level cabinets.

The next task is to answer some critical design and layout questions. Don't wait to address these issues or you're bound to wind up with a shoddy job.

What size and type of tile am I using? The homeowner typically chooses the tile on a custom job, but I can advise them on how their decision will affect the tile layout. For instance, clients will sometimes ask me to use a floor or shower tile for a countertop. Some of these tiles — though very attractive — don't have countertop trim pieces available. My job is to find trim pieces sold by another manufacturer that match in color, thickness, and size, or to modify the tile pieces available (see "Trim Tiles").

Is the client looking for a full tile layout? In most cases the plywood base is cut flush with the cabinet frame, keeping the trim tile tight to the cabinet. But on rare occasions I'm asked to do a "full-tile" layout with no cut tiles. In this case, I may need to extend the countertop beyond either the front or side edge of the cabinet by more than a few inches, and the cantilevered plywood will need some reinforcement. Usually this is done by adding a second layer of 3/4-inch plywood as a base or installing some type of metal or wood brackets or moldings.

What style backsplash and trim are called for? In kitchens we usually tile the backsplash all the way from the counter to the bottom of the wall cabinets. On a bathroom cabinet, the backsplash is usually one full tile. We trim the exposed sides of the 1/2-inch backerboard in either quarter-round,

or "radius bullnose," or apply "surface bullnose" directly to the finished wall.

Whether the perimeter of the countertop is to be trimmed in V-cap, speedcap, or wood, you need to know the dimensions of the trim.

Any through-the-backsplash switches or outlets required? Since I'm the only one who knows how all the layers (plywood base, substrate, thinset mortar, tile top, and backsplash) stack up dimensionally, I sometimes have to play electrician in order to get a switch or outlet through a backsplash. This work sometimes requires cutting out drywall to access the wires, so it is best to move any electrical boxes before installing the tile.

Besides adjusting the boxes for elevation, they should be adjusted for

depth in the wall. On remodels, I find myself with three options: screwing on extension plates that pull the outlets and switches out about 1/2 inch, installing new boxes the correct distance out from the wall, or buying longer screws and cutting the tile carefully so the tabs on the outlet or switch rest on the tile. The third option is most common in my area, but check with your local electrical inspector. Also, most codes require electrical outlets every 2 feet along the countertop, and any countertop outlet within 6 feet of a kitchen sink must be wired with a GFCI outlet.

What type of sink is used and what is its dimension? There are two basic types of sink installations: self rimming and inset. The self-rimming type is easiest to install since the rim

of the sink rests directly on the field tile. But clients typically prefer the inset type — whether "undermount" or "flush mount" — because cleanup on the countertop can be done with a sweep of a sponge into the sink. Also, the inset type is a little more sanitary, because it doesn't have a sharp corner where food and dirt can collect. The inset sink sits on the plywood base, and the substrate butts up to its outer edge or overhangs inside the bowl slightly.

Knowing the dimensions of the kitchen sink is critical to making an attractive layout. Because most kitchen sinks are rectangular and sit centered on the sink cabinet, they are a fixed part of the tile layout. Especially with an inset sink, you don't want to place a narrow band of tile along any of its sides.

Bath sinks, on the other hand, are usually oval, making tile layout much simpler, but the trim can be a little fussy around an inset sink. Typically the tile is set back about 1/2 inch from the sink, with the field tile cut in an arc and trimmed with 1- to 1 1/2-inch segments of quarter-round tile (see Figure 1). Keep the grout lines small or the edge will look like it has more grout than tile, which can be very unattractive.

The Plywood Base

After these layout questions are answered, it is finally time to get to work. I use mostly 4-inch ACX for my tile base. I use an exterior grade plywood for water resistance, and the good face grade gives me a smooth surface. This grade also has a tight core, which assures me I won't hit a void when screwing sink metal onto the plywood edge.

After cutting the plywood to size, I lay the sheet with the factory edge toward the cabinet face so that I have a nice, straight edge for the trim tiles. To secure the tile base, I screw through the plywood to the cabinet frame every 6 inches with 1 1/2-inch drywall screws.

Next, I trace the template that comes with the sink, and with a jigsaw cut a hole that is typically 1/2 inch smaller than the outer rim of the sink. I check the dimension of my hole a few times to make sure it is accurate, because this lip becomes the reference for knowing where to cut my tile around the sink hole.

Tile Substrate

Once the plywood base is on, we install the tile substrate. Because most countertops get wet, it is not advisable to use plywood as a tile substrate. Cementitious boards such as 1/2-inch Wonderboard or Durock work well, although recently I've been using Dens-Shield (Georgia-Pacific, 133 Peachtree St. N.E., Atlanta, GA

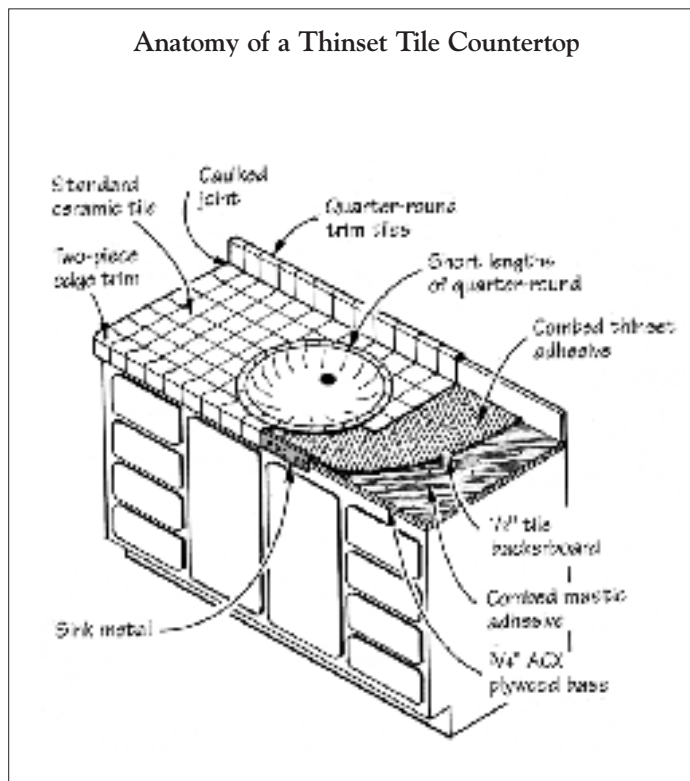


Figure 1. The author uses short lengths of quarter-round trim tile to finish around an inset oval sink. Sink metal reinforces the counter edge and provides a backing for the thinset adhesive.

30303; 404/521-4746). This is a gypsum-based product with a watertight plastic facing on the front and fiberglass mat on the back. It is quite a bit lighter and easier to cut than the cementitious boards, although it's about twice as expensive.

Both types of substrate are fairly simple to install using a thinset latex-modified mortar to bond to the plywood. First, comb the thinset onto the plywood, then cut the substrate for the sink. For a self-rimming sink, carefully cut the hole to the same size as the plywood opening. For an inset model, I usually cut the substrate back $\frac{1}{2}$ inch from the plywood so that the sink lip rests on the plywood. Screw the substrate into the plywood with $\frac{1}{8}$ -inch drywall screws about every 6 inches on-center. Drive all screws flush with the surface. Take extra caution, however, not to countersink screws through the Dens-Shield, because breaking the facing can ruin the product's ability to resist water.

Seams for both Dens-Shield and cementitious products are handled in a similar fashion. Spread 2-inch-wide fiberglass tape evenly over the seam and embed it in tile adhesive. Be sure to tape between the deck and the backsplash if tile is to be adhered to the drywall. This reinforces a joint that typically sees a lot of stress from the movement of dissimilar materials. Taping the joint won't stop this movement, but it will strengthen the joint.

Sink Metal

Though primarily used with mortar bed jobs, I often use sink metal with backerboard. Sink metal is galvanized metal that has closely spaced holes for mortar or thinset to key into. It also has periodic slots for an adjustable screw connection to the plywood base. Sink metal reinforces the edge of the counter and provides an accurate edge to connect trim tile to if you need to hang a "skirt" under a surface bullnose (see "Steps to a Thinset Countertop"). Sink metal is not necessary if you are using V-cap.

Tile Layout

With the substrate screwed down, I am ready to begin the tile layout. Having made the major layout decisions before the plywood base was set, the goal now is to transfer marks to the substrate as guides for the tile.

The best way to lay out any tile job is to create what is affectionately called an "idiot stick." This is a stick that has the tile width plus grout joint width marked for several tiles in a row. For a large countertop, I start by placing the trim tile on the counter edge and make a mark at its back edge on the counter surface. I make similar marks at all corners and snap chalk lines around the perimeter of the counter, defining the "field." This is where the idiot stick enters the picture.

On an L-shaped counter, I start the layout from the inside corners. In

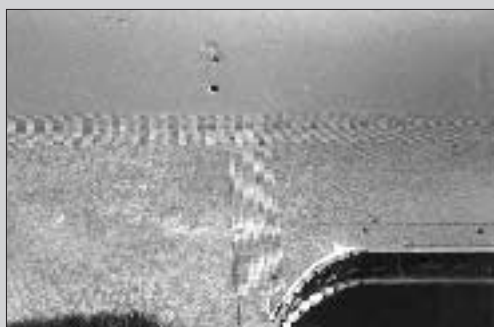
Steps to a Thinset Countertop



(A) In preparation for laying the tile on this vanity top, the author fastens the tile backer (Dens-Shield) over the $\frac{3}{4}$ -inch plywood base, then attaches sink metal to the counter edge.



(B) To ensure an accurate layout, he draws a line parallel to the sink-metal edge, using a sample tile for exact measurement.



(C) Before setting the tiles, he tapes the substrate joints with 2-inch fiberglass mesh and coats the tape with adhesive to strengthen the joint.



(D) The edge tiles are set first, beginning at the outside corner and working towards each end.

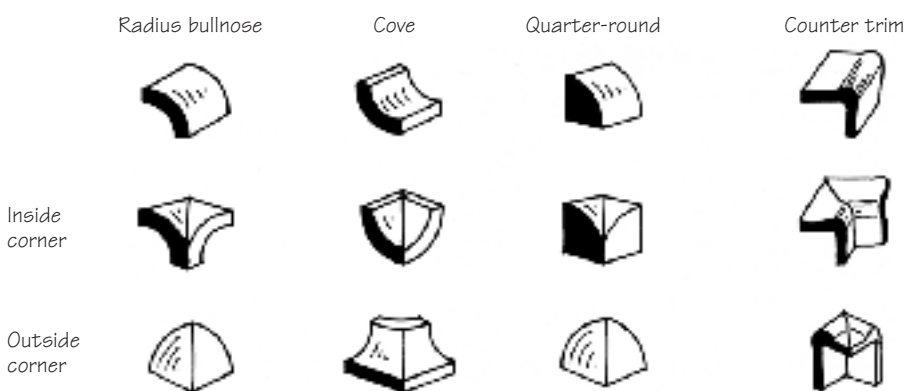


(E) With the edge tiles in place, the author spreads the thinset with a $\frac{1}{8}$ -inch square-toothed trowel.



(F) He lays the field tiles in place, checking for exact alignment with a straightedge.

Trim Tiles



Note: These common trim tiles are not available in every style or type of tile. Check with the tile manufacturer for the appropriate trim before buying the field tile.



Figure 2. Poor tile layout. Instead of leaving a narrow strip of tile along the backsplash, the tilesetter should have used one less full tile and set two "half" tiles at front and back.



Figure 3. Critical joint. The joint between the countertop and backsplash is very susceptible to cracking because the cabinet base and the wall expand and contract at different rates with moisture and temperature changes. Instead of grout, the author recommends using a colored caulk to match the other grout lines.

other words, I place a full tile at the corner and tile away from it in both directions. By placing the idiot stick in a couple of different directions from the corner, I can see how the rest of the field will lay out. The backsplash then simply corresponds to the field tile layout.

For bathroom vanities and straight kitchen countertops, the easiest layout approach is to start with a full tile at an end that is not against a wall. Then if the "idiot stick" shows that I end up with a small strip at a sink or at the very end, I split the difference at the two end tiles. For example, if I'm using a 6-inch tile and the stick tells me I'm going to be left with a 1-inch strip along the wall, I'll put a 3 1/2-inch cut tile at each end. This eliminates the narrow strip and creates a symmetrical look (Figure 2).

Applying The Thinset

With the layout finished we are ready to start tiling. Tile can be secured to the substrate with either a

mastic or with thinset cement-based adhesive. I prefer the thinset for a number of reasons. First, I can buy it pigmented to closely match the color of my grout. That way, if any grout lines wear through to expose the thinset, it won't look awful. Mastic is more expensive and is difficult to remove from a tile face after it dries.

To get a proper mix, follow the directions on the package. With most, you add two parts thinset to one part water or add water until the consistency is like mashed potatoes. Don't mix with a drill and paddle-bit, unless you keep the speed below 300 rpm. Any more velocity and you can whip air into the thinset, which will weaken the bond to the tile. Also, never add water to a thinset mixture after it has started to stiffen. Instead, simply mix it up again and it should loosen up to its original state. If your thinset sits for much over an hour, however, it might not loosen up and you'll need to mix a new batch.

I also use an additive in my thinset to increase bond strength and give flexibility to the hardened thinset. This helps the counter resist impact and stand up to freezing and thawing. The product I use is *Acrylic Mortar Admixture*, from Custom Building Products (13001 Seal Beach Blvd., Seal Beach, CA 90740; 310/598-8808).

All adhesives are applied with 1/8-inch notched trowels. My trowels, which I acquired in Germany, have square teeth. I haven't seen them locally, but similar trowels are made by A. Richard Ltd. (Impex Can-Am, Elm St., Door #1, Champlain, NY 12919; 800/724-5928). V-notched trowels are more commonly available, and will do the job adequately.

Laying Trim Tile

I begin by setting the trim tile on the counter edge. The trim tile is sometimes thicker than the field tile. By setting the trim tile first, I can raise the field tile to the right height by applying more thinset if necessary.

The quickest trim type to install is a single piece V-cap. To lay V-cap, I "butter" the back of each cap and set it on the chalk line. To keep a neat line, I use an aluminum straightedge and frequently sight down the edge of the counter. At inside and outside corners on an L-shaped counter, I miter the trim, or use special corner pieces if available.

Another option is to use two tile pieces to create a "skirt," as shown in Figure 1. This takes more time to install straight, but sink metal will help to ensure a neat job.

Laying Field Tile

Holding a 1/8-inch notched trowel at a 45-degree angle, comb the thinset material onto the field. It is important to apply the thinset consistently or the tile will be uneven. Do not comb more thinset than can be tiled in 20 minutes when working at ordinary indoor temperatures. In very hot weather, you may have only 10 minutes, while cooler weather may buy you 30 minutes or more. If thinset starts to cure before the tile is in place, the bond is significantly weakened.

If my grout line is greater than 1/16 inch, I place spacers between the trim tiles and the field tiles and carefully set the first row in place. If my grout line is 1/16 inch or less, I eyeball for consistent grout width. Some tile has built-in spacers for narrow grout lines.

I then take a mallet and firmly tap the tiles so that they get maximum coverage of thinset. If I notice that field tiles are not sitting evenly with the trim tiles, I'll pull them up and add or remove thinset as needed.

I repeat this procedure, placing spacers between all the tiles, and use a straightedge to keep them straight in both directions. I keep a water bucket and paint brush handy to clear away any thinset that works its way up into the grout joints. I also use a sponge to wipe any thinset off the top of the tile before it cures.

Setting The Backsplash

With the field and trim installed, I mark out the top of the first backsplash tile (tile plus one grout joint) with a level line and carefully comb the drywall with thinset up to, but not covering, the line. Then I use wedges or spacers on their sides to keep the tile on the level line.

If I am tiling a bathroom vanity, I usually install just a single row of surface bullnose. If tiling a kitchen with a backsplash that extends up to the wall cabinets, several rows of tile are needed. In that case, I trim out the outside edges of the backsplash with surface bullnose cut to match the width of the V-cap on the countertop, typically 1 7/8 inches.

Grouting

After the tile has had all night to set, we are ready to grout. For joints 1/8 inch or smaller, unsanded grout

is the appropriate material. For joints larger than this, sanded grout is recommended. I generally use the same additive that I use in the thinset mix to improve the performance of grout.

To mix, I pour the grout into a dry bucket and premix it dry to get all the pigments out of the bottom of the bag. I then put back in the bag what I don't need, add water and additive, and mix until it reaches a firm consistency.

I install the grout with a grout float, combing it diagonally over the tile. It is best not to install too much grout at a time because it will dry quickly; once dry, it is very difficult to remove. I also keep the grout out of joints to be caulked, typically the joint between the backsplash and field tile, and the joint between trim tile and an inset sink.

Once the initial grout is worked into all the joints, I remove most of the excess by running the grout float parallel with the joint. Finish cleanup is done with a grout sponge slightly dampened with water. By passing my sponge along the joints, I can shape the grout so that it is slightly concave and doesn't cover too much of the tile edges. With each pass, I rinse and ring out the sponge in a bucket of water, keeping the sponge as clean and dry as possible. If the sponge is too wet, the water can remove pigments and cause inconsistent shading after the grout has cured.

The grout on a kitchen counter should be sealed with one of the many water-based sealants available. Sealing keeps grease and other liquids from penetrating the grout and causing permanent stains. Manufacturers recommend that grout cure at least three weeks before sealing, so this requires a visit back to the site.

Caulked Joints

The next day, after the grout has cured, we caulk the joints that are the most susceptible to cracking. These include the joint between the countertop and backsplash, around the sink, and any joint between tile and another material, such as a cabinet or stove top. Many tile setters avoid this step, mainly because finding a matching caulk color is difficult and caulking requires one more trip to the job. If these joints are grouted, however, they will probably crack and allow water to penetrate within a matter of weeks (Figure 3). Some grout makers, like Custom Building Products, make caulk colors that coordinate with their grout colors, but any silicone or mildew-resistant caulk that matches in color will be fine. The wider the joint, the more critical it is to accurately match the color of the grout. ■

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