Undermount Sinks

Installing an undermount sink requires careful planning and coordination between subcontractors

by Martin Holladay

The demand for undermount sinks is growing. Even if you haven't had to install one yet, it is probably only a matter of time before a customer requests one. Because undermount sinks — also called undercounter sinks — are generally used only with stone or solid-surface countertops, they tend to be found in high-end kitchens. This raises the stakes for the builder, who is likely to face a more demanding client, and will need to coordinate the work between several subcontractors.

Customers who like the elegant appearance of undermounts are willing to pay an up-charge for them — not only for the countertop, but also for the cost of the sink and the additional installation time. Because sink manufacturers know that undermounts are used only with high-end countertops, they see no reason to market budget-priced undermount sinks. In general, the price of a double-bowl stainless steel undermount sink starts at $400, and heads north from there.

Figure 1. When a solid-surface sink is used with a solid-surface countertop, it is usually fused with the countertop, making an integral unit. This oval solid-surface lavatory (top) is manufactured by Swan. Solid-surface kitchen sinks are also available as apron-front models, like this single-bowl sink from Corian (above).

For less-expensive laminate countertops, a drop-in sink — also called a self-rimming sink — is usually required, because the sink cutout exposes the vulnerable particleboard substrate. However, Counter-Seal is now marketing a system for installing undermount sinks with laminate countertops (see "Undermount Sinks for Laminate Countertops," page 7).

A Wide Range of Materials

Like drop-in sinks, undermounts come in a wide range of materials, including cast polymer, stainless steel, enameled cast iron, enameled steel, vitreous china, copper, brass, and solid stone.

Cast polymer. Cast polymer (plastic) sinks make up a growing share of the market. Sink manufacturers generally divide cast polymer sinks into three different categories — cultured marble, solid-surfacing, and composite (see "Types of Cast Polymer," page 6). Although cultured marble is relatively inexpensive, it is less scratch resistant than other types of cast polymer, and is not recommended for use in the kitchen. At least one manufacturer, Lippert, makes an undermount bathroom lavatory out of cultured marble.

Solid-surfacing. Most manufacturers of solid-surface countertops also manufacture sinks out of the same material. Solid-surfacing, unlike cultured marble, is uniform throughout the entire thickness of the material. Any scratches can be sanded out, with no degradation of the finish, using 180- to 300-grit sandpaper.

Solid-surfacing is less stain resistant than most other sink materials. "There are certain stains that none of the solid-surface materials can resist," says Steve McNally, director of government and regulatory affairs for the International Cast Polymer Association, an industry group. "Cherry Kool-

Figure 2. Cast-polymer sinks with acrylic resin and quartz filler are often called composite sinks. This kitchen undermount is made by Blanco, which calls the material Silacron.

Aid is one. It is a very aggressive stain. In writing the national standards, we don't include resistance to cherry Kool-Aid, because nothing would pass if we did." Stains in solid-surface material, like scratches, can be sanded out.

Solid-surface sinks for both the kitchen and the bathroom are available from several manufacturers, including Avonite, Corian, Fountainhead, Lippert, Swan, Transolid, and Wilsonart (see Figure 1). Solid-surfacing fabricators can also make custom sinks in almost any size.

Composite sinks. Manufacturers usually use the term "composite" to describe a hard, scratch resistant type of cast polymer sink made with a filler of quartz or granite. High quality composite sinks, like solid-surface sinks, tend to have a high percentage of filler, resulting in a relatively high density. Blanco, Franke, Moen, and Schock all make composite undermount sinks (Figure 2).

Stainless steel. Although stainless steel sinks are unsurpassed for stain resistance, they can be dented. High-end stainless steel sinks — including almost all undermounts — are usually made from 18-10 stainless steel (18% chromium and 10% nickel) that is at least 18 gauge in thickness. Cheaper sinks tend to be made from lighter-gauge metal — 20 or 22 gauge — using a lower-nickel alloy like 18-8.

Blanco, Custom Sinks by Rachiele, Elkay, Franke, Just, Kindred, Kohler, Federal Product, Revere, Sterling, and Vance Industries all manufacture undermount, stainless steel kitchen sinks. Kohler also makes undermount bathroom lavatories in stainless steel (Figure 3).

Enameled cast-iron. Enameled cast-iron sinks are less likely to scratch than solid-surface or composite sinks, and they have a satisfying solidity and appearance. Enameled cast-iron sinks, unlike stainless steel sinks, cannot be dented, although their enamel can be chipped. Eljer,

Figure 3. Many undermount kitchen sinks, like this stainless steel sink from Franke, come in double-bowl models (top). To create a double-bowl kitchen sink, it is also possible to install two single-bowl sinks side by side. The solid-surface countertop around these two Elkay stainless steel sinks (middle) has been dressed up with a contrasting stripe. Although most bathroom lavatories are either vitreous china or cast polymer, it is possible to get a stainless steel lav, like this model by Kohler (bottom).

Figure 4. Enameled cast-iron sinks, like this double-bowl kitchen sink from Eljer, are often chosen for their resistance to denting and scratching.

Figure 5. Many bathroom lavatories, like this oval model from Eljer, are made of vitreous china (top). Although china is rarely used for kitchen sinks, Kohler does make a few undermount kitchen sinks out of fireclay, a type of vitreous china (above).

Kohler, and Vance Industries all make undermount enameled cast-iron sinks (Figure 4).

Enameled steel. Enameled steel sinks are usually considered to be a less expensive, less durable alternative to enameled cast iron. In order to add rigidity and durability to the basic enameled steel sink, American Standard has come out with the Americast line. These enameled steel sinks, which are available as undermounts, have a "structural composite" backing made of polyester resins and fillers. Americast sinks have been available since 1991.

Vitreous china. Vitreous china, also called porcelain china, is the same material used to make toilets. Vitreous china is an extremely durable product, able to last thousands of years. However, china can be broken if it receives a sharp blow. Kohler is the only manufacturer making undermount kitchen sinks out of vitreous china. Eljer and Germer both make undermount china lavatories (Figure 5).

Copper, brass, and solid stone. For customers looking for the unusual, it is possible to get an undermount sink in copper, brass, or solid stone (see "Sources of Supply," page 9).

Planning for an Undermount

If you're planning a job with an undermount sink, it is crucial to get the sink delivered early. If you don't have the sink on hand, the countertop fabricator probably won't even want to come to the site to make a template.

"One of the reasons I like to get the sink well in advance is to make sure it will work with the cabinet," says David Delp, a lead carpenter with Prime Construction in Burlington, Vt. Tony Pelcher, a solid-surface fabricator in Colchester, Vt., agrees. "A lot of times they're trying to stuff a large sink in a fairly small hole," says Pelcher. "If the sink is too big for the base cabinet, sometimes we have to cut away part of the cabinet. The less we have to cut away, the better we feel."

When specifying a sink, the kitchen designer needs to keep the requirements of the countertop in mind. For most countertops, the standard sink setback is $2\frac{1}{4}$ or $2\frac{1}{2}$ inches, while stone fabricators like to see a minimum of 3 or $3\frac{1}{2}$ inches on

all sides of the sink cutout. When the amount of stone remaining around a sink cutout is thin, the chance increases that a very expensive slab of rock could break during installation. "I've done a cutout that leaves only 2 inches, but it's risky," says stone fabricator Anita Socinski of A&M Stoneworks in Colchester, Vt.

Once you have the sink on hand and the base cabinets have been installed, the countertop fabricator can be scheduled to make the countertop template. During the visit, the fabricator usually wants to pick up the sink. In the case of a cast-iron sink, some countertop fabricators will pick up the sink manufacturer's template, leaving the sink behind, so the carpenters can build a cradle to support it.

Supporting an Undermount Sink

The installation instructions provided by undermount sink manufacturers can be vague, leaving the installer to decide how to support the sink's weight. Adequate support is especially important for large sinks or those made of cast iron.

"People want bigger and deeper sinks all the time," says Rick Brown, product developer for Kindred Industries, a sink manufacturer. "If you hang it from the counter, you have to think about how much it weighs when it's full of water." Some manufacturers, including Corian, recommend that their sinks be supported by a site-built wooden cradle installed in the base cabinet. Eljer's instructions explain, "The structure built to support the sink must be able to support a minimum of 350 pounds. There are many ways to install an undermount sink, and the details of the installation will depend on the quality of your cabinets and countertop. … It may be necessary for you to reinforce the sides of the cabinet for it to support the 350-pound minimum."

Some sink manufacturers understand that an easier installation system needs to be devised. "We're working on developing a new system for attaching undermount sinks," says Tom Dewane, associate product manager at Kohler. "But for the time being, it's still necessary for the installer to build a box." Vance Industries has developed an installation kit for undermount sinks (Figure 6). The kit includes two weight-supporting aluminum rails equipped with bolts to clamp the sink against the countertop. The Sink Undermounter kit is available from Vance in three sizes, with list prices from $37 to $68.

Most site-built cradles are made of plywood, 2x4s, or angle iron, and support the sink under the sink flange. "Cast-iron sinks are never totally flat," says Socinski. "They sometimes crest in the middle. The contractor needs to check the height of the sink with a long straightedge from one side of the cabinet to the other." The rails should be located so the highest point of the undermount sink ends up at exactly the same height as the top of the base cabinets. If the sink flange varies slightly in height, any discrepancies will be easily sealed with silicone caulk.

While some installers insist that an undermount sink

Figure 6. Many undermount sinks, especially large sinks and cast-iron sinks, need to be supported on rails. Vance sells the Sink Undermounter kit, which includes two aluminum rails. The rails have bolts that hold the sink flange against the countertop.

Types of Cast Polymer

Solid-surfacing, composite, and cultured marble products are all types of cast polymer. General distinctions between the three categories can be outlined, although the three terms are marketing designations rather than technical terms.

All cast polymer sinks are made from two basic components: a plastic resin and a filler. When a manufacturer is formulating a cast polymer product, it can choose between two basic types of resin — polyester and acrylic — and a variety of fillers, including calcium carbonate, quartz, and alumina trihydrate.

Cultured marble. One of the first cast polymer products was marketed as "cultured marble." Cultured marble uses a polyester resin with calcium carbonate (crushed limestone) as a filler. To make a cultured marble sink, the liquid ingredients are simply poured into a mold. The manufacturing process introduces tiny air bubbles, making the material somewhat porous. To make the product more stain resistant, cultured marble is always sold with a shiny gel-coat finish, similar to the gel coat on a fiberglass tub.

"The gel coat on cultured marble is only 18 thousandths of an inch thick," says Steve McNally of the International Cast Polymer Association. "Once you go through the gel coat, your stain resistance is gone."

Solid-surfacing. Corian, developed in the late 1960s by DuPont, was the first solid-surfacing material. Solid-surfacing is manufactured using vacuum mixing, which results in a non-porous material that does not require a gel coat.

Solid-surfacing is denser than cultured marble, because it has a higher proportion of filler — typically about 65%. Instead of calcium carbonate, solid-surfacing uses alumina trihydrate, a man-made material, as a filler. Alumina trihydrate imparts fire resistance, making solid-surface better able to resist cigarette burns than cultured marble.

Like cultured marble, many brands of solid-surfacing are made with polyester resin. However some, including Corian, use an acrylic resin, or a combination of polyester and acrylic.

Composite sinks. Technically, the term composite refers to a polymer material with fiber reinforcement. Sink manufacturers, however, use the term loosely to describe sinks with an acrylic resin and a filler of quartz or granite. Composite sinks tend to be relatively hard and scratch resistant.

must always be supported on site-built rails, others depend on clips attached to countertop anchors, or even just silicone caulk. "People don't like to see 2x4s propping up their sink," says Tony Pelcher.

Regardless of the method used to support the sink, it is prudent to use a reversible installation method. When an undermount sink is hung on angle-iron rails, or when there isn't much clearance in the base cabinet, there may be no way to pull the sink out from underneath. Since lifting a stone countertop after the silicone has cured can damage the stone, it is wise to consider how you would go about removing a damaged sink.

Installing an Undermount Sink

The job of attaching an undermount sink to the countertop is sometimes performed by the builder, sometimes by the countertop sub, and sometimes by the plumber. With a solid-surface countertop, the solid-surface contractor usually attaches the sink to the countertop in the fabrication shop. With an unwieldy stone countertop, the sink is almost always installed on site. "Generally, I don't want to attach the sink," says Socinski. "But sometimes the plumber doesn't want to touch it, and so I'll do it."

Solid-surface countertops. When a solid-surface countertop receives a solid-surface sink, the countertop is usually fused to the sink to create a single integral unit, using the same techniques as for joining countertop seams. The sink opening in a solid-surface countertop is usually cut with a router, and then the rim is sanded with 120- and 180-grit sandpaper.

A variety of methods are used to mount sinks that are made out of material other than solid-surfacing. Pelcher has

Figure 7. Some solid-surface fabricators attach undermount sinks with custom sink clips made from blocks of solid-surface material. The blocks are attached with solid-surface adhesive.

had no problems attaching stainless steel sinks to solid-surface countertops with silicone alone, so that the sinks are hanging by a bead of caulk. "I would be leery of using that method, because of the weight of the sink when it's filled with water," commented Tom Dewane from Kohler. "Our company wouldn't recommend it."

For heavier sinks, including vitreous china and enameled cast-iron sinks, Pelcher makes custom clips from solid-surface blocks. First, he prepares small blocks, the same thickness as the sink flange. These blocks are glued to the underside of the countertop, around the perimeter of the sink flange. Then larger solid-surface blocks are glued to the small blocks, forming a lip that extends over the sink flange. Other fabricators make one-piece rabbetted mounting blocks, with the depth of the rabbet corresponding to the thickness of the sink flange (Figure 7).

Some sink manufacturers recommend that their undermount sinks be mounted to solid-surfacing with stainless steel sink clips bolted to brass anchors. These expanding anchors, which have a female machine thread to receive the bolts, are inserted into 1/4- or 3/8-inch-diameter holes drilled 1/2-inch-deep in the underside of the countertop. Each stainless steel bolt gets a wing nut, which is tightened down against the sink clip.

Before the sink is attached, the sink flange and the contact area of the underside of the countertop are cleaned with alcohol. Then a continuous bead of silicone sealant is applied, and the sink is attached.

Stone countertops. Stone fabricators cut out the sink opening with a wormdrive saw equipped with a diamond blade. The countertop is delivered to the job site before the sink is attached. Usually the holes for mounting the

Undermount Sinks for Laminate Countertops

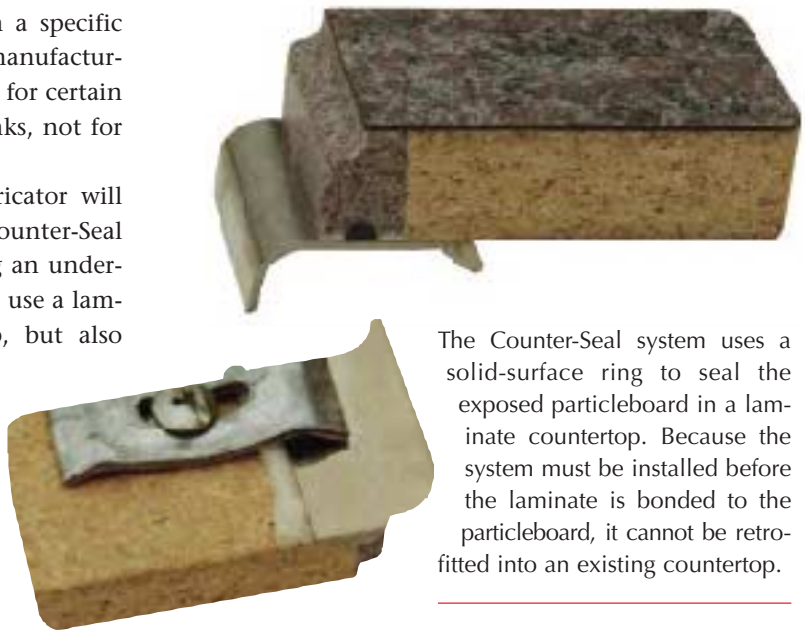
A Canadian company is marketing a product that promises to permit an undermount sink to be installed with a laminate countertop. Counter-Seal's patented system uses a seamless solid-surface ring to seal the cutout opening in the laminate countertop, protecting its particleboard substrate. The ring is installed by a certified countertop fabricator before the laminate is glued to the substrate. The system includes special templates for the fabricator, and all necessary sink-mounting hardware.

Counter-Seal produces its solid-surface rings out of the same material, and in the same colors, as Wilsonart's solid-surface products. The rings are made in 53 different shapes, with each shape intended to match a specific model of sink from one of 11 different sink manufacturers. The Counter-Seal system is available only for certain models of stainless steel and solid-surface sinks, not for cast-iron sinks.

In most cases, a certified countertop fabricator will charge about $250 to provide and install a Counter-Seal ring. The system lowers the cost of installing an undermount sink, not only because it is possible to use a laminate instead of a solid-surface countertop, but also because the system allows some types of drop-in sinks to be undermounted. Although some solid-surface fabricators have experimented with installing an inexpensive drop-in sink under the countertop, as if it were an undermount model, this usually doesn't work. Since most drop-in sinks do not have a flat sink flange, it is difficult to get a good seal between the sink and the countertop. Counter-Seal claims to have solved the problem with their custom mounting hardware and redundant seals.

The Counter-Seal has only been on the market for a couple of years, and it remains to be seen how well the adhesives and seals will hold up to a decade of daily splashing. Since a kitchen sink is a ruthlessly wet environment, and since particleboard cannot tolerate getting wet, cautious builders may take a wait-and-see attitude.

For more information, including a list of certified countertop fabricators, contact Counter-Seal Corp. (604/464-7266; www.counter-seal.com).



The Counter-Seal system uses a solid-surface ring to seal the exposed particleboard in a laminate countertop. Because the system must be installed before the laminate is bonded to the particleboard, it cannot be retrofitted into an existing countertop.

Figure 8. Undermount sinks are attached to stone countertops with clips that bolt into anchors. The anchors, which have female machine threads, are epoxied into shallow holes drilled in the stone.

Figure 9. Before the stone countertop is lowered for the last time, a generous bead of silicone caulk is applied around the sink flange. This stainless steel sink is supported by custom-made angle-iron rails, which also help support the granite.

faucet have already been drilled, although these holes are sometimes drilled on site with a diamond-core bit.

A stainless steel or composite undermount sink is attached to a stone countertop with sink clips, which are generally provided by the sink manufacturer. The clips are held by bolts screwed into metal anchors that are epoxied into the stone (Figure 8). Kohler is the only major sink manufacturer to provide anchors with its undermount sinks.

The number of anchors required is usually specified by the sink manufacturer, varying from only four anchors for some lavs up to 15 or more for a large kitchen sink. "With cast-iron sinks, we don't even drill anchors," says Anita Socinski. "We just make the contractor provide a wood frame to support the sink."

Most stone anchors are epoxied into 3/8-inch-diameter, 1/2-inch-deep holes drilled with a conventional diamond bit. However, a German company has developed a tool that is able to drill a flared hole in stone, with the bottom of the hole wider than the top. This undercut hole receives a proprietary anchor. This tool, called the Keil Anchoring System, is available for about $3,800 from Southwest Equipment of Naples, Fla. (800/476-3737).

Some installers attach the sink to a stone countertop while the countertop is upside down on the floor. Others wait until after the countertop is installed. "The piece of granite is a big monster," says David Delp, of Prime Construction. "When the granite is installed, you want to be able to slide it, without a bump."

Regardless of how an undermount sink is supported, it is always attached to a stone countertop with silicone caulk (Figure 9). Because cold temperatures can interfere with the curing of the silicone, a stone countertop should be allowed to acclimate to room temperature before the sink is attached. The silicone should cure for several hours before the plumber attaches the sink basket and tailpiece.

Martin Holladay *is an associate editor at* The Journal of Light Construction. *Special thanks to A&M Stoneworks of Colchester, Vt., and Vermont Solid Surface of St. Johnsbury, Vt., for their assistance with this article.*

Sources of Supply

American Standard
1 Centennial Plaza
Piscataway, NJ 08855-6820
800/442-1902
www.us.amstd.com
Enameled steel sinks

Blanco America
1050 Taylors Ln., Unit 4
Cinnaminson, NJ 08077
800/451-5782
www.blanco-america.com
Stainless steel and composite kitchen sinks
No bathroom lavs

Custom Sinks by Rachiele
257 Sleepy Hollow Rd.
Pittsburgh, PA 15216
800/881-9044
www.rachiele.com
Stainless steel and copper sinks

DuPont Corian
P.O. Box 80012
Wilmington, DE 19880-0012
800/426-7426
www.dupont.com/corian
Solid-surface sinks

Eljer Plumbingware
14801 Quorum Dr.
Dallas, TX 75204-7584
800/423-5537
www.eljer.com
Enameled cast iron kitchen sinks and vitreous china bathroom lavs

Elkay Manufacturing
2222 Camden Ct.
Oak Brook, IL 60523
630/574-8484
www.elkay.com
Stainless steel sinks

Fountainhead
8305 Telegraph Rd.
Odenton, MD 21113
877/386-4323
www.ftnhead.com
Solid-surface sinks

Franke
3050 Campus Dr., Ste. 500
Hatfield, PA 19440
800/626-5771
www.myfranke.com
Stainless steel sinks from Switzerland

Gerber Plumbing Fixtures
4600 W. Touhy Ave.
Lincolnwood, IL 60712
847/675-6570
www.gerberonline.com
Vitreous china bathroom lavs

Inova
9 Mars Ct.
Montville, NJ 07045
800/544-6682
www.shock.de
A distributor for Schock composite sinks from Germany

Just Manufacturing
9233 King St.
Franklin Park, IL 60131
847/678-5150
www.justsinks.com
Stainless steel sinks

Kindred Industries
1000 Kindred Rd.
Midland, ON L4R 4K9
Canada
705/526-5427
www.kindred-sinkware.com
Stainless steel sinks

Kohler
444 Highland Dr.
Kohler, WI 53044
800/456-4537
www.kohlerco.com
Stainless steel, enameled cast-iron, and vitreous china sinks

Lippert Corporation
W142 N8999 Fountain Blvd.
Menomonee Falls, WI 53052
800/869-8775
www.lippertcorp.com
Cultured marble and solid-surface sinks

Republic by Federal Product
600 Jonesboro St.
Ruston, LA 71270
800/637-6485
Stainless steel, composite, brass, porcelain, and copper sinks

Mario & Son
6523 E. Main Ave.
Spokane, WA 99212
509/536-6079
www.marioandson.com
Importers of solid stone sinks from Spain

Moen
25300 Al Moen Dr.
North Olmsted, OH 44070
800/553-6636
www.moen.com
Stainless steel sinks

Revere Sink
12 Coffin Ave.
New Bedford, MA 02746
800/225-8585
Stainless steel sinks

Sterling Plumbing
2900 E. Golf Rd.
Rolling Meadows, IL 60008
888/783-7546
Stainless steel sinks

The Swan Corporation
One City Centre, Suite 2300
St. Louis, MO 63101
800/325-7008
www.theswancorp.com
Solid-surface sinks

Transolid
2599 Charlotte Hwy.
Mooresville, NC 28117
800/766-2452
www.transolid.com
Solid-surface sinks

Vance Industries
250 Wille Rd.
Des Plaines, IL 60018-1866
847/375-8900
www.vanceind.com
Stainless steel, brass, and enameled cast-iron sinks

Wilsonart International
P.O. Box 6110
Temple, TX 76503
800/433-3222
www.wilsonart.com
Solid-surface sinks