

Plastic

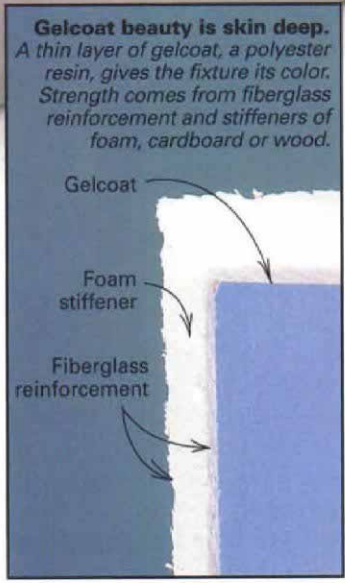
One-piece fixtures are

by Scott Gibson

Any plumber in America contemplating three flights of stairs and a 350-lb. cast-iron bathtub would be happy to give you at least one good reason why someone invented the plastic tub-shower. Until the 1960s, a knee-buckling delivery of a heavy tub to a second- or third-floor bathroom was routine. When the plumber had finished hooking up the tub and shower, a tile installer would complete the job. The result was certainly durable, but the process took time and specialized skills. Plus a strong back.

Then came a boom in plastics. Steadily improving polyester resins, and better equipment to combine the material with chopped fiberglass, allowed the mass production of all kinds of things—boats, car fenders and panels for truck trailers and plumbing fixtures. One-piece plastic tub-showers were light and relatively inexpensive, and they could be installed quickly. Later, manufacturers began making combination tub-showers from molded acrylic plastic reinforced with fiberglass.

Combination tub-showers are now made by dozens of companies, large and small, and in a



Gelcoat is the thrifty standard.

Although more lavish models are readily available, this gelcoat tub-shower is typical of fiberglass-reinforced bathroom fixtures designed as economical alternatives to traditional bathtubs.



Right this way. A clean polyester-resin mold for a fiberglass-reinforced tub-shower is rolled toward the start of the production line at the Aqua Glass plant outside of Memphis, Tennessee.

Tub-Showers

quick to install, but should you buy a gelcoat or an acrylic model?

variety of price ranges. The most elaborate models include a half-dozen shower heads, CD players, television screens, steam generators and whirlpool jets (gazing at one of these aquatic entertainment centers at a Chicago trade show earlier this year, a dumbfounded observer wondered aloud, "Why would anyone ever get *out* of the shower?"). Most tub-showers are more basic than that.

No matter what the brand name or its features, a plastic tub-shower will be either fiberglass-reinforced plastic, what the industry usually calls FRP or gelcoat, or molded acrylic plastic. In addition to one-piece fixtures, limited by their size to new construction, you may also choose a remodeler's tub-shower that is assembled from three or four separate pieces small enough to be maneuvered through a finished house (for more, see the sidebar on p. 112).

Plumbers may not buy as many Doan's Pills as they used to, but they are not universal in their praise of either gelcoat or acrylic tub-showers. Although manufacturers disagree, many plumbers don't think plastic tub-showers

will last as long as cast iron and tile. One-piece plastic fixtures come in a few standard sizes that are harder to adapt to odd-size bathrooms. Plastic can be noisy, and it doesn't retain heat as well as cast iron. Even so, their seamless, no-leak design and advantages in weight and ease of installation have made plastic tub-showers as common as plastic-laminate countertops (for more on installation, see the sidebar on p. 111). And there's no getting around the lower cost. An acrylic tub-shower can cost about \$1,000, rivaling the cost of a traditional installation. But no-frills gelcoat models start at about \$200 at big building-supply dealers.

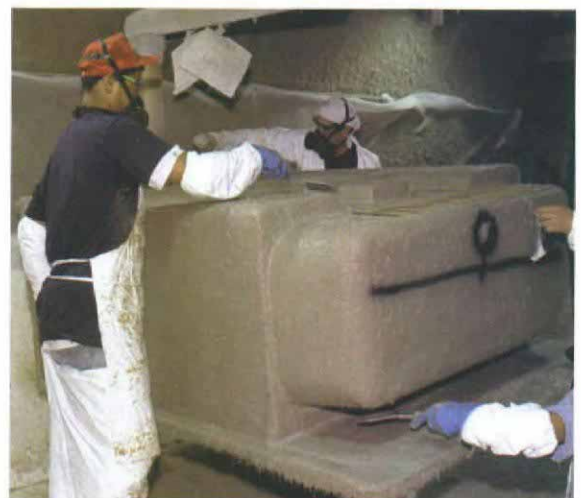
Gelcoat is the less expensive, most common option—The plastic tub-shower owes its existence to a marriage of chemistry and assembly-line efficiency. A gelcoat tub-shower is built from the inside out, beginning with a mold in the exact shape of the finished product (photo to right, facing page). The mold is a positive—the first layer of material applied to it becomes the finished side when the mold is removed.

What goes on first is the gelcoat layer, a special polyester resin that forms the smooth outer surface of the fixture (photo left below). The gelcoat layer determines the fixture's color. Manufacturers may apply gelcoat a little differently (one coat or two, for instance), but this layer is essentially a paint film. When dry, it's 20 mils thick, more or less. Subsequent coats of chopped fiberglass and polyester resin are applied to what will be the back of the fixture, the part you never see (photo left, facing page). As soon as these laminating coats are applied, every inch of the fixture is rolled down by hand to squeeze out voids between the gelcoat and the chopped fiberglass (photo right below).

Between laminating coats, workers also apply wood blocks and other stiffeners to reinforce the tub floor and shower walls. Sheets of corrugated cardboard are a common choice for the stiffening material in tub walls, wood in the floors. I thought one manufacturer, Tennessee-based Aqua Glass (800-238-3940), had a better idea—a layer of expanding polyurethane foam between coats of fiberglass chop instead of card-



First stop on the production line is a gelcoat spray booth where the mold is sprayed with an initial coat of resin. In later steps, chopped fiberglass twine is mixed with polyester resin to build wall thickness.



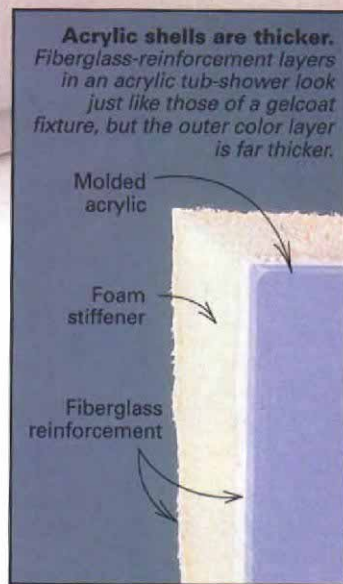
Bubbles or voids in the fiberglass layer will weaken tub-shower walls, so fixtures are thoroughly rolled out by hand after they are sprayed.



board on shower walls. Foam reinforces the fiberglass, deadens sound and helps the tub to hold heat. No matter what material, it is covered by the next fiberglass layer.

After the last coat of fiberglass is applied, the tub-shower is popped off the mold, and gets drain and overflow holes and a grab bar. Rough edges are ground down, and the fixture is inspected, packed and then shipped. What the customer will get is a fiberglass-reinforced thermoset plastic shell somewhere between $\frac{1}{4}$ in. and $\frac{3}{8}$ in. thick, weighing between 125 lb. and 145 lb. An economy-grade gelcoat tub-shower is likely to be white or off-white with a simple grab bar and a molded ledge you can use as a soap dish. Spend more money, and you will get higher shower walls; a deeper, wider and more comfortably molded tub; a greater choice of colors; and more elaborate contours and detailing in the shower walls. The basic fiberglass construction, however, probably will be the same. Standard tubs are either 45 in. or 60 in. long, and from 30 in. to 42 in. wide. Heights typically range from 72 in. to 78 in. At the low end, a gelcoat tub-shower is about \$200. Although prices vary regionally, more elaborate models cost between \$400 and \$500.

One company uses a two-part mold to make fiberglass fixtures—A variation on this theme is the Vikrell tub-shower made by Sterling (800-783-7546), a Kohler-owned company in Rolling Meadows, Illinois. These units are manufactured with the same ingredients as a standard gelcoat tub-shower. But instead of laying up a fixture with several layers of chopped fiberglass and polyester resin, Sterling mixes resins, chopped fiberglass, coloring agents and other ingredients and puts them in a big compression mold. Two halves of the mold are



An acrylic tub-shower has a roof.

Vacuum molding dictates the full enclosures typical of acrylic fixtures. This model is a three-piece sectional tub-shower designed for the tight confines of a bathroom remodel.



Acrylic tub-showers are vacuum-formed. A $\frac{1}{8}$ -in. thick sheet of acrylic plastic is warmed in a 400°F oven and then rolled over the mouth of an aluminum vacuum mold at a Lasco plant in Virginia.

Installation tips for plastic tub-showers

Rex Cauldwell, a Virginia plumber and electrician, thought it would be a good idea to support the floor of his new plastic tub so that it wouldn't flex when he used it. Some manufacturers recommend the practice, suggesting the tub floor be bedded in mortar or gypsum plaster. But Cauldwell was intrigued with the possibilities presented by expanding polyurethane foam. So he foamed up the bottom of the tub and set it in place. After the foam had hardened, the tub was as unyielding as a concrete pier, just as Cauldwell had hoped. The foam, however, had hoisted the tub off the floor by more than 1/4 in. as it expanded

and cured. It required some artful work with a handsaw to settle it back down.

How much urethane foam is too much is one of many lessons Cauldwell has learned in years of installing gelcoat and acrylic tub-showers. The hardest part of the job is working around the plumbing—maneuvering the fixture past the protruding valve stem and shower arm and attaching it to the waste and overflow line. An excellent explanation of the process is contained in *Installing and Repairing Plumbing Fixtures* (The Taunton Press, 1994) by Peter Hemp, a California plumber. Hemp has a number of

suggestions for this tricky piece of business but warns that you should plan on sliding the fixture in and out several times before you get it right.

Tips from Hemp and Cauldwell include these:

- Make sure the alcove for the tub-shower is framed correctly, with a level floor and plumb walls. Schematic drawings from the manufacturers can be wrong, Hemp says, so the safest route is to have the fixture on site before framing the alcove.

- If possible, install the finish floor first and run it into the tub alcove to eliminate a seam, and potential leak, at the junction of tub and floor.

- If the framed alcove is just a little snug, don't try kicking in a plastic tub-shower the last 1/2 in. It will crack. Make sure nailing flanges meet framing materials evenly. If they don't, shim between the flange and the framing. Screw holes for the flanges should be predrilled and countersunk.

- A flexible 90° elbow on the drain line may help to prevent leaks caused by constant flexing in the floor of the tub, especially if you don't set the tub on mortar, plaster or foam.

- Consider stuffing fiberglass insulation around tub walls before installation to improve heat retention.—S. G.

brought together, squeezing the material into its final shape. Sterling bought the patented process from Owens-Corning in 1987.

Like gelcoat, Vikrell is a thermoset plastic that will not change its shape with heat once it has cured. The company says that its tub-showers will not chip, crack or peel because they are not laminated. Color is molded all the way through the unit. Structural ribs that are molded into the fixtures add rigidity and support, the company says. Vikrell fixtures are priced between gelcoat and acrylic units. One key difference, however, is that the Sterling tub-showers are not available as one-piece units. They all come only as four-piece units that include a tub

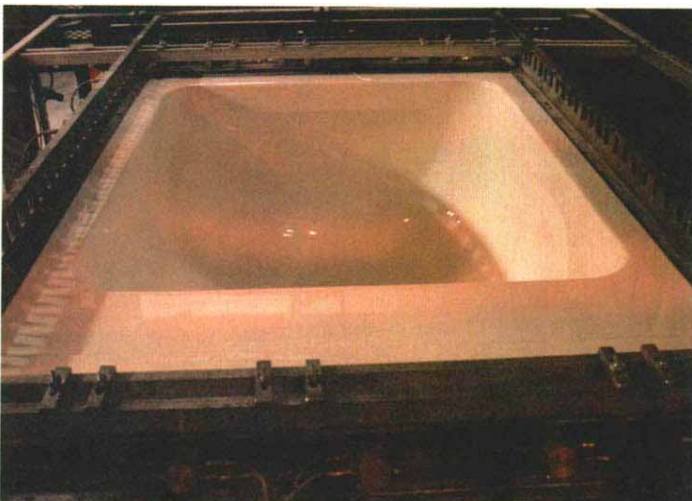
and the three wall sections that snap together to form the wall surround.

Molded acrylic is a higher-priced alternative—For a good idea of how a molded-acrylic tub-shower is made, round up a gang of 6-year-olds and give them each a paper cup. Within five minutes, one of them is bound to put a cup over his mouth and start sucking out the air. Eventually, the cup collapses. This is essentially how you make an acrylic tub-shower (photos below). This shell is reinforced with chopped fiberglass and resin, just like a gelcoat fixture.

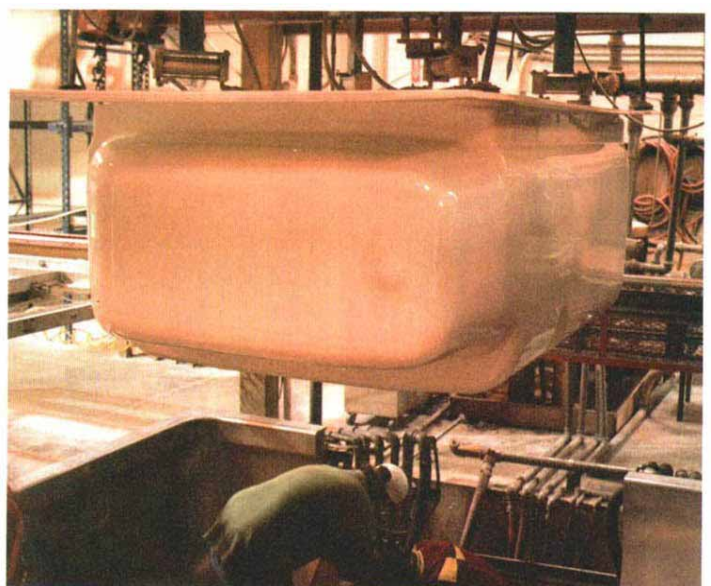
Acrylic tub-showers typically cost between two and two-and-a-half times as much as compara-

ble gelcoat models. Manufacturers say acrylic is more durable, more scratch resistant, easier to maintain and easier to repair than gelcoat. Because the shell is formed from a sheet of material far thicker than gelcoat, the color coat is that much thicker.

Part of the higher expense of acrylic fixtures is explained by the manufacturing process (an elaborate aluminum mold can easily cost \$100,000) and partly because more materials are used. One distinguishing feature of an acrylic tub-shower is its dome or ceiling. Because the fixture is formed in a vacuum mold, it must be closed on all sides (manufacturers that offer open-top acrylic tub-shower units form



A tub-shower in less than a minute. Warm and pliable, the acrylic quickly takes the shape of its mold under the pressure of a vacuum (above). After cooling, the finished shell emerges (right).



When a one-piece fixture is just plain too big

A fiberglass or acrylic tub-shower offers one hard-to-beat feature: Its seamless design eliminates potential leaks that cause havoc in the bathroom (and in ceilings below). The drawback is that a one-piece fixture must be moved into an unfinished bathroom during the early stages of construction. By the time walls are framed and doors are hung, it may be impossible to maneuver even a small one-piece fixture (72 in. high and 30 in. wide) through the house. So manufacturers also offer multipiece, or sectional, tub-showers made specifically for remodels. These fixtures usually come in three or four pieces, all small enough to be maneuvered down hallways and through finished

door openings. Once in the bathroom, the pieces are reassembled and installed. Just like a shingled roof, a sectional tub-shower gets its watertightness from overlapping seams that channel water outward. When you're installing one of these fixtures, the tub goes in first, followed by panel sections making up the walls of the shower. Seams may be either horizontal or vertical. Nailing flanges on the top edge of the tub tuck behind wall layers so that water can't run behind the fixture.

Vikrell fixtures made by Sterling use a snap-together joint between wall sections that does not require any additional fasteners or caulk. More



An old tub gets a face-lift. Chicago-based Luxury Bath Systems updates worn cast-iron bathtubs and aging tile walls with custom-molded acrylic replacements. No demolition is required.

common are wall-seam joints that require at least some caulk plus screws or bolts to complete the seal. A top-quality silicone caulk is the sealant of choice.

If you want a new tub-shower, you could be excused for not

wanting to tear out the tile walls and tub you already have. It's a dirty, time-consuming job complicated by the weight of a cast-iron tub and fairly elaborate plumbing. Luxury Bath Systems (800-822-7905), a

them the same way but then cut off the dome). Extra material means extra height: Acrylic fixtures typically run to about 84 in. high, several inches taller than a gelcoat tub-shower.

Although acrylic fixtures get the same fiberglass reinforcement as gelcoat tub-showers, some resin additives may be a bit different. Lasco (800-877-0464), for instance, adds what it calls microspheres (little balloons) to the resin used in acrylic models to increase rigidity and to make the fixture more resistant to impact damage. Additives also add to the price.

Your building inspector may require a certified tub—Once every couple of months, an inspector from the National Association of Home Builders' Research Center walks unannounced into a bathtub factory and chooses a fixture at random. It is pulled off the line and shipped back to the center's lab in Upper Marlboro, Maryland, where Chuck Arnold is waiting to go to work. In rough terms, Arnold's job is to

make the plumbing fixture think it has been installed by a careless plumber in a household of overweight, hyperactive chain smokers.

The research center is one of a number of independent certifying labs around the country that make sure gelcoat and acrylic plumbing fixtures meet requirements of the American National Standards Institute. Developed during the 1960s, the ANSI Z-124 performance standard is meant to reassure building officials, builders and homeowners that plastic tub-showers will perform the way manufacturers claim they will. According to Arnold, building officials in many parts of the country are becoming more likely to require that new plumbing fixtures meet the Z-124 standard. Small manufacturers that distribute fixtures in limited geographic areas may not go to the trouble or expense of hiring a certifying lab to check quality, but big companies do.

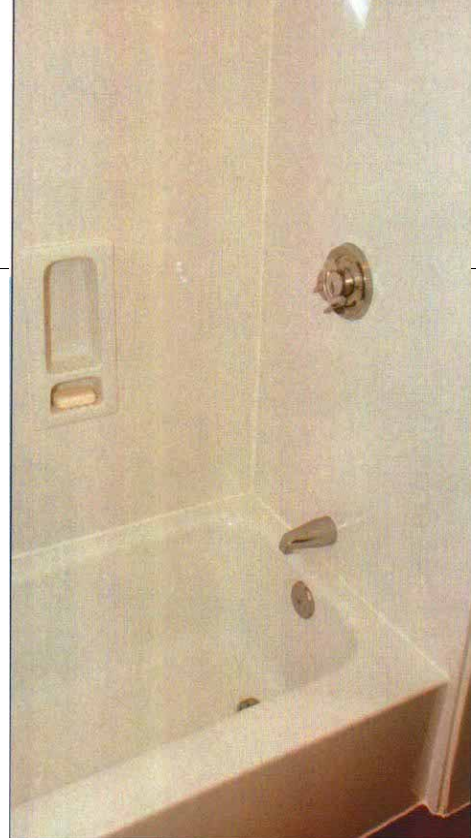
Z-124 simulates what a tub-shower would go through in its lifetime. And what a lifetime. Load tests include lowering a 300-lb. weight into the

tub and measuring sag, or applying a 25-lb. force against the shower walls to see how much they bend. Arnold and his colleagues drop a ½-lb. steel ball into the tub to see what happens, burn the fixture with a plumber's torch, heap common chemicals on the surface to see how it will stain and leave burning cigarettes on the plastic surface to measure damage. Lab technicians even have something called a "xenon weatherometer," a device that compresses five years of window-light exposure into 200 hours. If a tub-shower meets the standards, that fact will be noted on the label or in the literature that comes with the fixture.

Common problems include thin or improperly applied gelcoat layers that show up in wear and durability tests, and insufficient fiberglass chop around drain-fitting areas and on walls. Acrylic fixtures, Arnold says, do show a more consistent surface finish and fare better in boiling-water and wear-and-cleanability tests. They can, however, suffer from the same structural prob-



Acrylic is lightweight and easy to maneuver. Connecticut contractor Paul Foley fits a new acrylic tub over a cast-iron fixture that will remain in place. The two are bonded with silicone caulk and butyl tape.



New tub in a day. Foley installs a new tub in a day, a plus for clients unwilling to put up with construction delays.

Chicago-based company, pondered that dilemma and came up with an answer (photos above). For between \$1,500 and \$2,000, the company covers up the old tub and walls with a new acrylic shell. A local

contractor measures your existing tub and orders a replacement. Back in Chicago, the company chooses one of the 400 vacuum molds it has on hand (they are made from old bathtubs) and produces a 1/4-in,

thick acrylic shell. In about a day, the contractor fits this new skin over the existing tub, bedding it in butyl tape and silicone adhesive caulk, and installs acrylic-sheet shower walls. No tear-out is required.

If there's any question about water damage in existing walls, the contractor will tear out some of the existing tile walls and make sure the substrate is sound before the new surround goes in.—S. G.

lems as gelcoat fixtures. If made correctly, Arnold says, gelcoat tub-showers seem to perform about as well as the more expensive acrylic models in many of the center's tests.

In addition, the building department in your area may require that a tub-shower meet other fire or building codes. Just because you can buy a tub-shower locally doesn't mean it will get the okay from a by-the-book plumbing inspector in your town. To be safe, check to make sure the tub-shower you have in mind meets local codes—before you have it entombed in the second-floor framing.

Choosing the right plastic tub-shower—

How much you spend makes a big difference in what you get. You can buy an economy-grade gelcoat fixture for a whole lot less than what you'd spend on a cast-iron tub and tile—\$200, say, as opposed to \$1,000 and up (prices vary by region). But the gelcoat will look and feel a lot less substantial. The plastic surface will be

more susceptible to damage. A budget model with low shower walls will force you to mount the shower arm in the drywall above the plastic, unless you don't mind stooping to wash your hair. Color choices are limited. These factors suggest that a budget gelcoat fixture is good for a seasonal home or a children's bathroom.

A more expensive gelcoat fixture, something that costs \$400 or so, will get you higher shower walls, a bigger tub and a wider choice of colors, all of which are attractive features for not a lot more money. But at the top of the pecking order are acrylic tub-showers. Although they cost a couple of hundred dollars more, starting at about \$750, acrylic fixtures have some inherent advantages over gelcoat. As one manufacturer put it, you get a better material and more of it—a harder and thicker shell that does better in the NAHB Research Center's cleaning and wear tests. Its domed roof simplifies bathroom construction and allows you to add a steam generator to the shower if you want. With their undu-

lating contours, acrylic tub-showers are sleek and stylish in a way that basic tile isn't. But here's the rub: An acrylic fixture at the upper end of the price range approaches the cost of a cast-iron tub and tile shower walls.

There are a half-dozen or so major players in the market and scores of smaller companies. If you're considering a plastic fixture, it's probably worth your time to visit a well-stocked plumbing-supply house and compare brands. Whether you choose acrylic or gelcoat, look for heft and weight as well as attractive styling and a blemish-free finish.

No matter what you end up with, remember that the enemy of plastic fixtures is improper cleaning: the compulsive germophobe armed with a can of Comet and a scouring pad. If you buy plastic, make sure you use only the cleaners recommended by the manufacturer. □

Scott Gibson is senior editor at Fine Homebuilding. Photos by the author.