

ceramic mold making techniques



tips for making plaster, bisque, and
styrofoam molds, making and
using casting slip, and
decorating ceramic surfaces

Ceramic Mold Making Techniques | Third Edition

Tips for Making Plaster, Bisque, and Styrofoam Molds, Making and Using Casting Slip, and Decorating Ceramic Surfaces

Molds make it possible to repeat patterns and forms for a variety of reasons. For thousands of years, potters have used molds both for forming and decorating and often both have been accomplished at the same time. Whether you choose to try press molds with slabs of clay or slip-casting molds for slip-cast pieces, you'll discover that molds provide a way to create uniform pieces that can save you time and provide you with the means to concentrate on surface decorations.

How to Make a Model and a Mold for Slip-casting

by Andrew Gilliatt

Learn how to make a model for a shape that you create a mold from. Whether simple or complex, you'll need to follow the same steps for figuring out to make an original model then determining the best way to cast the mold pieces.

How to Make and Apply Decals to Slip-cast Vessels

by Linda Gates

One of the advantages of slip-cast work is the smooth surface, which is perfect for adding decals. Linda Gates shows you how to slip-cast smooth pieces then how to create decals and apply them.

Making a Tile Press Mold

by Ursula Hargens

Ursula Hargens was looking for larger surfaces to decorate so she came up with a tile design that suited her needs. Her deep tiles are press molded in a plaster mold and feature some unusual shapes that she plays with to create negative spaces.

Creating a Slump Mold with Styrofoam

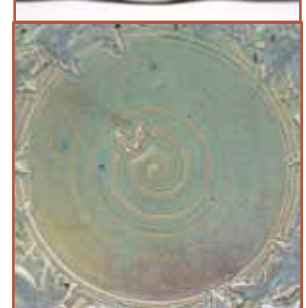
by Ben Carter

Ben Carter loves working with earthenware and he's an innovator in creating really cool forms using a Styrofoam slump mold. Without a doubt, Styrofoam molds are the easiest molds to make and they offer a tremendous amount of flexibility.

Making Bisque Molds with Texture

by Nancy Zoller

Before the invention of plaster or Styrofoam, the main mold making material was bisque-fired clay. Create your own unique forms from clay and surfaces then easily repeat them over and over again. You're just a bisque fire away from getting started.



How to Make a Model and a Mold for Slipcasting

by Andrew Gilliatt



Andrew Gilliatt's work combines colored porcelain slip, brightly colored glazes, resist patterns, and simple decals to create pots that convey the fun he has working in the studio.

Identifying ways of working that successfully support your ideas can be just as critical and expressive as the ideas themselves.

With my functional pots, I'm designing pieces that, with the use of color and imagery, are expressive, visually inviting, and easily accessible for domestic use.

The process I developed includes sketching, using drafting software, making models with MDF, then making plaster molds from those models. The forms can then be repeated, and each one individualized through surface decoration and glazing.

Making Prototypes

Each new piece begins with a prototype, generally made of wood or MDF, from which I create a plaster mold. The prototypes can be made from clay, but I prefer using wood for its durability. I'm not the savviest mold maker, so if at some point I have an accident

during the mold-making process, the prototype is safe and intact. I've also found that making prototypes from wood is great for achieving sharp, transitional lines and edges (*figure 1*). Once I've settled on a design, I produce two scale drawings—one illustrating the side view or profile, which includes the number of stacked pieces of MDF I will need to make the model, and one illustrating the top view. Using the first drawing as a blueprint, disks of MDF are cut, glued together, stacked, and turned on a lathe to make a solid round form whose shape is close to the side profile of the finished piece (*figure 2*). Tip: You can use a Surform tool to shape the MDF if you do not have a lathe. The second drawing works as a cutting template that is glued to the top of the form (*see figure 2*).

Using a band saw, I cut into the shape of the form, carefully following the outside edges of the glued-on template. The sides of the form are then sanded smooth

to erase any irregularities from sawing. Finally, the prototype is sealed with one coat of Minwax Sanding Sealer and two coats of polyurethane.

The casting slip I use has a 16% shrinkage rate so the prototype must be made appropriately larger to accommodate the final size of the pot (see the reverse shrinkage equation for help with the math). Always test the shrinkage rate of your casting slip before making the prototype.

Making the Mold

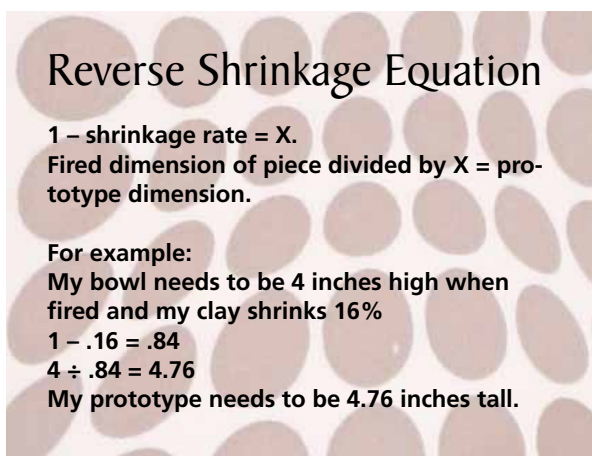
When making molds, it's important to remember that casting, like any other building method, is strictly a means to a desired end. It doesn't have to be an overly technical venture and, depending on the form, can be quite easy. I've learned to make molds simply by reading books on the subject, and by asking for help from others.

The biggest trick to making molds is figuring out the number of parts to cast. Most of my molds are made with four parts—a bottom, two sides, and a top piece used as a pouring gate or slip reservoir. Before I make a mold, I take my prototype and draw seam lines on it with a black marker so that I know how many parts I will need for the mold (*figure 3*). Then I add a clay slab to the top of the prototype for a pouring gate (see *figure 4*). By making my pouring gate just a little taller than need be, I can control the quality of the rim after the piece has been cast.

Next, I embed the form into a block of clay up to the seam lines marking off the first section of the mold, set up cottle boards, seal the seams between the blocking clay and the cottles, and pour the plaster. Parts of the blocking clay are removed as I'm ready to cast successive sections. The image shows the mold halfway through the casting process, with the bottom and first side cast, and the second side and slip reservoir or pouring gate still to be cast (*figure 4*). Note that the location of the seams has been planned so that they correspond to edges or places where planes and curves shift, rather than flat faces of the form. This makes them easier to clean up, and makes them less noticeable in the finished form.

Mixing the Casting Slip

Most of my pots are cast using two different slips—a colored casting slip for the exterior of the piece, and a white casting slip for the interior. Both are made from the same base recipe.



Reverse Shrinkage Equation

1 – shrinkage rate = X.
Fired dimension of piece divided by X = prototype dimension.

For example:
My bowl needs to be 4 inches high when fired and my clay shrinks 16%

1 – .16 = .84
4 ÷ .84 = 4.76
My prototype needs to be 4.76 inches tall.

The colored casting slips are tinted using Mason stains. Using only colored slip would be more expensive, and, lining the colored slip with a white slip allows me to get different color effects on the interior and exterior of a form using only one glaze.

The colored slip is essentially a decorative coating, much like an engobe applied to a thrown or handbuilt form, but in this case, the coating is laid down first.

To make the colored slip, ball mill 100 grams of stain per gallon of white casting slip and let them mix for two hours (14 lbs. of casting slip is roughly equivalent to one gallon). Ball milling gives a more consistent color saturation than blunging and the stain mixes in with the wet slip more easily. If you do not have a ball mill, use a kitchen blender and mix in small batches before combining.

Test shrinkage rates when using more than one slip in the same cast, even if they are made from the same base recipes. If the different slips have different rates of shrinkage, they will crack.

Casting the Pieces

Wet the mold with a sponge. Pour the colored casting slip into the mold and let it set up for approximately ten minutes (*figure 5*). Then pour the colored slip out of the mold and let it drain (*figure 6*). Once the slip has stopped dripping from the mold, immediately pour in the white casting slip. Leave the white slip in the mold for about 30 minutes before draining. The longer you leave the slip in the mold the thicker the piece will be. I prefer to make my pots just a little on the thicker side.



1
Finished wooden prototypes of various vessels sealed with polyurethane.



2
Turn a solid, laminated MDF form on a lathe to get close to the right profile.



3
Finish shaping the prototype on a band saw and draw seam lines.



4
Add a clay slab to the sealed prototype to create a pouring gate or slip reservoir.



5
Pour colored casting slip into the plaster mold first.



6
Drain the excess colored casting slip from the plaster mold.



7
Cut away the pouring gate. Keep the blade flat on the top of the mold.



8
Finish the rim with a red rubber rib. Note the striations of contrasting colored slip.



Cone 10 Recipes

"5,4,3,2,13" Porcelain Casting Slip

Grolleg	5 lb
Water	4 lb
Kona F4 (sub. Minspar)	3 lb
Silica	2 lb
	<u>14 lb</u>
Add: Sodium Silicate	13 g

Colored slip additions (Mason stains)

Black: MS 6600	100 g
Pink: MS 6020	120 g
Yellow: MS 6450	120 g
Blue: MS 6376	50 g
MS 6332 Orchid	25 g

Note: 14 pounds of slip is just under one gallon. To make colored casting slip, add 100–120 grams of commercial stain per one gallon of slip, then ball mill the slip for at least two hours to ensure even dispersal of the colorant.

Blue/Violet Glaze

(fires translucent blue in reduction and purple in oxidation)

Custer Feldspar	28.2 %
Wollastonite	26.5
Grolleg	20.7
Silica	24.6
	<u>100.0 %</u>
Add: MS 6332 Orchid	4.0 %

Green/Maroon Glaze

(fires translucent green in reduction and maroon in oxidation)

Strontium Carbonate	10 %
Cornwall Stone	40
Whiting	15
Grolleg	15
Silica	20
	<u>100 %</u>
Add: MS 6006 Deep Crimson	6 %



9
Cast bowl, dried and ready to remove from the mold.



10
Decorate the bisqued bowl using masking tape and stickers.



11
Remove stickers and tape then clean up after the bowl has been dipped in glaze.



12
Applying the decal onto the fired bowl by sliding away the paper backing.

Finishing the Cast

Remove the top piece of the mold (here the pouring gate section is removed first) when the slip is no longer glossy or tacky. Using an X-Acto knife, cut away the excess clay. Hold the blade flush with the top of the mold as a guide. After piercing the form in one spot, angle the blade in the same direction of your cut so that you're always cutting the interior wall first, then moving through to the exterior. By doing so, you press the form back into the mold walls as you cut, and avoid warping the form by pulling the walls away from the mold (*figure 7*).

Smooth the rim with a damp sponge and a soft, flexible rib (*figure 8*). Let the piece dry sufficiently before removing it from the mold (*figure 9*). Once the piece is bone-dry, remove any seam lines with an X-Acto blade, fettling knife, or metal rib. Smooth away any inconsistencies using drywall sanding mesh and a sponge. **Caution:** Always wear a respirator when sanding pots.

Glazing and Firing

I leave patterned areas on the outside of my vessels unglazed to expose the colored clay underneath. Stickers and masking tape work great as a glaze resist and give a far crisper and better line quality than anything I can achieve using wax and a brush.

Clean the bisqued ware with a damp sponge. Using a pencil, outline the areas you want to leave bare. Follow the lines with masking tape (I use quarter-inch masking tape because it is more flexible than the wider tapes). For curved lines, focus on laying down just the outer edge of the tape rather than trying to lay down the whole width of the tape all at once (*figure 10*). With the resist pattern complete, dip or spray to apply the glaze. Peel away the tape and stickers as soon as the glaze is dry enough to handle (*figure 11*). Make sure to peel away the stickers entirely. Any remaining residue will leave a noticeable blemish even after firing.

One upside to using different colored casting slips is that the glazes you use will have a different color quality on glazed and unglazed areas, depending on the color of the clay underneath, and the translucency of the glaze.

Laser Printer Decals

I make my own decals using a laser printer. I generate the images on a computer and then simply print onto water slide decal paper. HP laser printers work well and some types of copiers also make these decals. I use decal paper from www.papilio.com. You can also make handmade

drawings to scale or use found images and then scan them into a computer or have them photocopied, just as long as they are printed on water slide decal paper. (For more information, you can also refer to the article on laser transfer decals by Frank Gaydos on p. 7 in the Sept/Oct 2006 issue of PMI, or the July 23, 2008 Ceramic Arts Daily feature "The Details on Decal Paper for Ceramics" by Paul Andrew Wandless.)



Op Dot Jar, 7 in. (18 cm) in height, colored porcelain, glaze, fired to cone 10, decals added and fired to cone 2.

The iron oxide contained in the toner of laser printers is what makes this method work as a ceramic process. (This method will not work with ink jet printers!)

Laser printer decals work just like traditional water slide decals but with a few exceptions. For starters, the only color they fire to is a sepia or red ochre. Depending on what color clay or glaze you fire them on and depending on the opacity/transparency you select to print them, a broad range in tonality can be achieved. Secondly, these decals have no flux in them so they must be fired hotter than cone 018 (which is generally suitable for lusters, china paints, enamels, and

overglazes) so that they melt to the glaze. I have found that cone 04–2 works best for high-fired ware.

For most glazed surfaces, you must fire the decals to at least cone 04. However, if your glazes are cone 04 the decals will dissolve away, so testing at a lower temperature is in order. For all of my cone 10 clay and glazes, I do a second decal firing to cone 2. At cone 2, the decals will fuse to both the glazed and unglazed areas. Any lower, the decals will melt only to the glazed surfaces.

Applying the Decals

After the glaze firing, sand any exposed areas of bare clay with 400-grit sandpaper for a smooth finish. Cut out the decal you wish to use. Don't worry about cutting away negative spaces, any excess material will burn away and this will make for easier application. Place the decal in room temperature water and wait for it to become fully saturated. Hold the decal onto the piece, ink side down, and slide away the paper (*figure 12*). The decals will still work if you don't place them ink side down, but the image may not be as clear.

With the decal placed on the ware, use a sponge or rubber rib to remove any excess water and to remove any air bubbles that might be trapped under the decal. Trapped air pockets may cause the image to bubble or become distorted. Be careful not to work the decals too hard; they are thin plastic and can tear easily. Make sure there is adequate lubrication when smoothing away air pockets. For large decals, or for decals that need to curve, use a hair dryer to lightly heat the decal to make it more pliable. Always let decals dry overnight before firing.

How to Make and Apply Decals to Slip-cast Vessels

by Linda Gates



The distressed or worn surface treatment and nostalgic images of paper dolls on Linda Gates' works transport the viewer (and artist) to a different time.

For the last year, I've used images of the paper dolls I remember from my 1950s childhood as the primary focus of my ceramic work. The idea started with my final year's project in the ceramic design program at Bath Spa University in England. I decorated ceramic surfaces using commercial digital decals with imagery of everyday objects from the 1950s, including the paper dolls of that era. Just before graduating, I set up my studio with an electric kiln, a table, and a couple of shelves so I could continue working. Though my studio is small (7×13 feet), I've found that digital technology and the ability to order custom-made decals of my own designs has

made it possible for me to continue and expand upon the investigations started while I was a student.

Image Sources

I use a combination of my drawings and found images to create my surface designs. I search for vintage dolls in my local city of Bath and further afield at book fairs, vintage fairs, antique toy shops, and online auctions. The ephemeral nature of paper dolls means that few have survived. However, some were carefully packed away into attics, and see the light of day again when the attics are cleared (*figure 1*). Many of the lovingly played-

with dolls are tattered and torn and need repair or new clothes drawn for them. For this, I use a combination of sketches and Photoshop images (*figure 2*).

It's important that the dolls evoke the period and match the ones of my childhood memories. As they can be difficult to find, I often draw the dolls and dresses using inks and watercolor paints and pencils.

Life in the 1950s was not yet dominated by blatant consumerism, and I want my work to reflect this time of simple, carefree pleasures. By introducing text with messages such as 'No Batteries Required', I'm highlighting the contrast with the electronic toys of today.

Designing Decals

The decals I use are commercially made from Photoshop documents of my scanned images. In the U.S., compa-

nies like Bel Inc. and Easy Ceramic Decals will produce custom-made ceramic decals of your designs. In England, I've used FotoCeramic. They are based in Stoke-on-Trent, the historic center of pottery manufacture in England.

Using Photoshop, scan the drawings, manipulate and enhance them, and finally put them together into an 8½×11 inches document and make sure the mode is set to CMYK for the color rather than RGB, and the resolution is print quality (at least 300 dpi). Most decal companies will accept documents sent via email attachment when you place your order. The finished, printed decals will then be sent to you in the mail. The paper backing sheets are printed with ceramic inks, then laminated with fritted sheets, which ensure the inks fuse into the glaze when fired (*figure 3*). To save space and money, many decals are printed on the same sheet of decal paper. To keep the



1 Vintage paper dolls used as image sources for custom ceramic decals.



2 Sketches and scanned images can be enhanced and compiled using Photoshop.



3 Sheets of custom printed decals created from Photoshop files.



4 Four-part plaster mold used for slip-casting the jug form.



5 Plaster mold for the handle. The two openings allow air to escape.



6 Secure separate parts of a plaster mold before filling with casting slip.



7 Allow the forms to set up before removing them from the molds.



8 While the forms are leather hard, cover surface with a colored engobe.



9 Add border of underglazes to the surface, then bisque fire the piece.

decals organized, clean and dry, cut around each one and put them into individual envelopes until needed.

Casting a Form

Ceramic decals can be applied to any glazed object, but it makes life easier if the ceramic form has smooth surfaces to avoid the problem of trapped air creating bubbles and holes in the image. The ceramic form shown here is a slip-cast jug that I designed as part of a college tableware design project. With a little modification to the original jug design, I made new plaster molds, one for the body of the form and the other for the handle (*figures 4 and 5*). The mold for the body of the jug is made in four parts—the two sides, the base, and the reservoir.

To prevent leaks when pouring the casting slip, secure the parts firmly together with strong bands cut from rubber inner tubes. If you design your mold to include a reservoir, which makes it easier to maintain an even rim thickness, fill the mold to halfway up the reservoir wall using a commercial casting slip of your choice (*figure 6*). As the porous mold absorbs the water from the clay, the

excess is drawn from the reservoir. The handle mold is also filled with casting slip. Once the slip is the desired thickness (check by blowing on the edge of the mold where the slip and plaster meet), pour the extra casting slip back into the container and leave the mold inverted at an angle to drain into a bucket. Placing it at an angle avoids stalactites of clay forming on the bottom of the piece. **Tip: To achieve an even wall thickness in multiple casts, time the first casting and use this as a guideline for when to drain the slip each time.**

When the mold is well drained and the sheen has gone from the wet casting slip (typically about 20 minutes), remove only the reservoir portion from the jug mold, trim the excess clay from the top and clean it up with a damp sponge. I leave the rest of the mold intact for another hour or so for the form to firm up for easier handling. Both molds are then disassembled and the jug form and handle carefully removed (*figure 7*). Both component parts are cleaned up with a fettling knife and damp sponge. The handle is attached, and the form is covered in plastic for 24 hours to ensure a secure join.



10 For a distressed or antique look, coat the forms with a thin wash of iron oxide.



11 Select and cut out a group of decal images for use on each glazed form.



12 Soak the decal in distilled water for a minute to release image from the paper backing sheet.



13 Prior to firing, the decal retains the color of the fritted laminate sheet (in this case blue). This color burns out.

Decorating Techniques

At the leather-hard stage, I decorate the jugs with colored slips and give them borders of commercial underglazes (*figure 8 and 9*). When the jugs have been bisque fired to cone 04, I give them a wash of iron oxide to dirty them down and give a distressed look because otherwise the bare slip-cast surface is gleaming white (*figure 10*). This surface is further enhanced with underglaze crayons and pencils.

Once you've applied any underglaze decoration to your pieces, they're now ready for a coat of clear

Ordering Your Own Custom Digital Ceramic Decals

United States suppliers

Bel Inc. (beldecal.com)

Easy Ceramic Decals

(www.easyceramicdecals.com)

UK supplier

FotoCeramic (www.fotoceramic.com)

South African supplier (ships internationally)

JT McMasters (www.skolldecal.com)



Make Do and Mend, 5 in. (12.5 cm) in height, slip-cast earthenware, slips, underglazes, oxides, and digital transfers, 2008.

glaze and put into the kiln on stilts, if necessary, for firing. Decal transfer works best on shiny, smooth glaze surfaces, so keep this in mind when selecting a glaze. After glaze firing, the ware must be handled as little as possible as the surface must be clean and free of grease from fingerprints. To ensure this, wipe the surface with rubbing alcohol.

Decalomania

Now comes the fun part—selecting, arranging, and applying the images (*figure 11*). Gather the cut-out decals you want to use together with a shallow tray and some distilled water, which is free of contaminants, a kitchen towel for blotting excess water, and a soft rib and natural sponge to smooth out any air bubbles. Soak the decal in the distilled water for about a minute until you can see the image start to release from the paper backing sheet (*figure 12*). Carefully position the decal onto the dampened smooth glaze surface, gently slide away the backing paper from beneath the image, and smooth out the image using the soft rib or damp sponge. Once removed from its paper backing, the decal is very flimsy and must be handled with great care. There is a short opportunity to reposition the image and rub out any air bubbles using a rubber rib and a sponge while the transfer is still wet and before it dries and attaches itself to the glazed surface. At this stage, the decal will still retain the color of the fritted laminate sheet, which in my case is blue (*figure 13*). This burns out in the firing.

When all the decals are applied and fully dried, the jugs are ready for the final firing. Because it is just high enough to melt the glaze slightly, the ware must again be placed on stilts. During the firing, the fritted laminate will fuse the ceramic inks into the glaze, making them permanent. Cone 014 is the usual decal firing temperature, but reds do tend to burn out. To overcome this, I prefer to fire to approximately cone 015 with a 15 minute soak to make sure the inks fuse into the glaze. **Note:** Always check with the decal manufacturer for the appropriate firing temperature. As always in ceramics, it is very important to test as kilns and materials vary. The kiln used for decal firings must be well ventilated. Make sure all vents are open, and if you have a ventilation system attached to the kiln, be sure to turn it on when firing decals. The fumes are toxic so the room must also be well ventilated and the kiln preferably fired when there is no one around. I have discovered that I can add more layers of decals and fire the piece again as long as the subsequent firing does not to exceed the original decal firing temperature.

With very little equipment—a small kiln, a computer, and a bucket of clear glaze, I am having fun enjoying my second childhood.

Making a Tile Press Mold

by Ursula Hargens



Wallflower (Reflection), 56 in. (1.4 m) in height, earthenware, glaze, fired to cone 05, gold luster, fired to cone 018. Photo by Peter Lee.

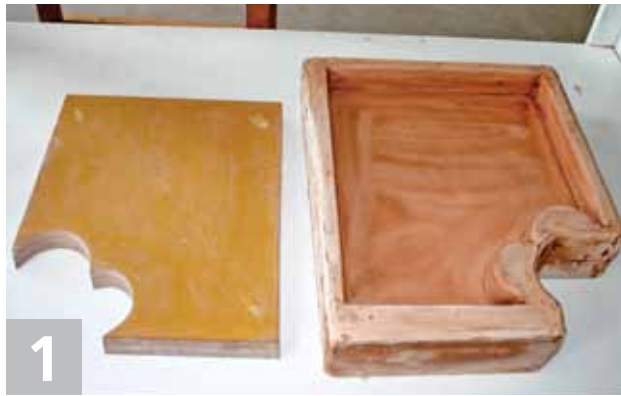
As the decoration on my thrown work has become more detailed and elaborate, I've begun looking to extend my decoration over larger surfaces. I chose wall tiles as a way to create large-scale compositions, treating the ceramic surface as a single canvas.

In designing my tiles, I set out to create standardized units that could be configured in multiple ways. My goal was to make tiles that were manageable but could be combined to create larger compositions. Altering the shape of a traditional square tile by manipulating the silhouette allowed me to create patterns with the tile forms themselves. I could use the same molds to make different shaped surfaces, giving me the ability to modify the overall size or orientation of a piece.

In my Wallflower series, I use two tile molds to create arrangements that reflect different compositional approaches—a repeating pattern and a single decorative pattern that spans the surface of the tiles. The cutouts in the tile provide an added challenge, requiring the surface decoration to respond to the empty spaces, corners, and edges created by the irregular shapes.

Making the Template and Mold

To make the tile mold, begin by cutting a positive model out of medium density fiberboard (MDF) using a table saw and jigsaw. Sand the model to create a slight angle so you can remove it after the plaster sets up, and apply several coats of polyurethane to seal it. Make a tile press mold by setting up wooden cottles in a square, clamping them, and filling the seams with clay coils. The



1 MDF positive next to the finished plaster press mold.



2 Use a tarpaper template to cut a slab for the mold.



3 Add clay strips for the sides and reinforce with coils.



4 Apply one or more coats of white slip.

cottles should be at least one inch from the edges of the MDF model. Then, secure the model so it won't move when the plaster is poured around it, coat it and the surrounding surfaces with Murphy's Oil Soap, and pour in enough plaster to cover the mold by at least one inch. After the plaster sets, remove the cottles, clean up the edges of the mold with a rasp, and dry it for several days (figure 1).

Pressing a Tile

To make a tile, roll a slab of clay ½-inch thick, and cut it in the shape of your tile. Use the MDF model as a guide or make a flexible template from cardboard or tarpaper (figure 2). Gently lay the slab into the mold and press the clay down, paying attention to the corners and edges as those are the areas often missed. Next, cut strips of clay to press into the sides of the mold and reinforce the seams with coils (figure 3).

Cover the tile with plastic and leave it overnight so that it sets up to leather hard. The next day, place a board across the mold opening and flip it over as you would flip a cake, so that the tile rests on the board. You may need to tap the mold with your fist to make the tile pop out. Clean up any rough edges with a rib.

Applying Slip

Coat the tile with a first layer of slip (figure 4). A white slip produces a light ground and brightens glaze colors, but any slip color can be used. Note the consistency of the slip and the wetness of the brush. If the slip is thin and applied in quick, single strokes, it appears translucent in places with the red clay showing beneath. If the slip is thicker (like cream) and applied in multiple strokes, it creates an opaque, white surface. You can also affect the way the slip lays on the surface through the wetness of the brush; a wet brush gives you a lighter, more fluid application and a dry brush pulls on the surface leaving a denser, slightly textured slip layer. Allow the slip to dry until the sheen is gone and it becomes firm to the touch.

Using Paper Resist

Now apply any secondary slip designs using paper resist techniques. I make colored slips by adding 10–20% stain to a white slip base, but any commercial underglaze or slip will work. Draw an image or shape onto newspaper. If you're going to repeat a design, make a master template out of heavier cardstock that you can



5 Apply colored slip over the clay and paper resist.



6 Apply additional layers of slip design.



7 Poke holes through a paper design.



8 Make a pouncing sack.



9 Pounce the design.

trace if you need additional shapes. Use several pieces of newspaper so you're cutting multiple sheets at once. With scissors or a matte knife, cut an outline of the pattern. Keep both the positive and negative image intact so you have the option of using both the original shape and the outline in your design.

Lay the paper cutout on the surface and spray with a light mist of water to adhere it. Try not to use too much water as it can cause the white slip ground to moisten and smudge. Using your fingers, press the edge of the paper to the surface so there are no buckles or gaps around the edge of the design for slip to seep underneath. After all excess water from spraying has evaporated, apply colored slip, brushing from the perimeter inward (figure 5). Once the paper has been tacked to the surface by the slip, you can go back over it to create lines or texture with your brush. Wait for the slip to lose its sheen, and use a pin tool to lift up the paper from the surface, revealing the resist pattern (figure 6). This process can be repeated multiple times to extend a pattern or create a layered surface.

Dry the tiles slowly between layers of sheetrock (drywall) boards and put something heavy (the press mold itself works fine) on top to prevent warping. I bisque my tiles to cone 03 in an electric kiln.

Apply a Repeated Pattern

In order to repeat a glaze pattern multiple times, I use the Renaissance technique of pouncing. Trace the outline of the tile and pencil in a design for that tile shape. Then, perforate the paper by poking holes along the lines of the design with a pin tool (figure 7). This step is tedious, but once it's made, your outline can be used over and over again. When finished, lay the paper on top of a bisqued tile and rub a charcoal stick over the holes. I've found I get a darker outline using a pouncing sack that I make by pouring powdered graphite (available at most art supply stores) onto a small, cloth circle that is gathered and tied off with a string or twist tie to create a small bag (figure 8). Pat the sack over the pin-pricked design to release the powder through the holes (figure 9).

Once the pattern is pounced on the tile, trace the outline with a pencil to connect the dots and secure the pattern since the tile is often heavily handled in the glazing process and the pounced pattern can be easily blown away.



10 Apply a glaze outline.



11 Fill in the outlines.



12 Pour clear glaze over the surface.

Applying Glaze

The first step to glazing is outlining the pattern. I use a black glaze that I mix in small batches at a thicker than normal consistency. You can also let a glaze stand for a few days with its lid off to thicken it through evaporation. The glaze is then put into squeeze bottles with needle tips and applied as a drawn line. You can buy squeeze bottles at ceramic supply stores or make your own (see box). I recommend using a 16 or 18 gauge nozzle.

The glaze line produced from the applicator creates a raised line, making a little wall of glaze (figure 10). The second step in glazing is to fill in the walled-off areas with colored glazes (figure 11). The glazes for this step should be a cream-like consistency so they flow into the walled-in reservoir and create an evenly glazed surface. If the glaze accidentally extends outside the desired area, it can be scraped off with a pin tool or small knife when dry.

Once all the areas are filled in with glaze and the surface is dry to the touch, brush liquid wax resist over the glazed areas. This keeps the glazes true to their original color and texture after the next step and prevents the design from running and blurring. After applying the wax, allow the pieces to stand overnight so that the wax resist dries fully and there's less clean-up.

The final glazing step is to dip, pour, or brush clear glaze over the surface (figure 12). This fills in back

ground areas not covered by the colored glazes. I mix this glaze to a skim-milk consistency so it repels easily from the waxed areas. If it does cling to the waxed parts, remove it by dabbing with a damp sponge.

Firing and Hanging

After glazing, fire to cone 05 in an electric kiln. I bisque higher than I glaze fire to minimize pinholing and other glaze defects. After this firing, I frequently apply gold luster in small areas and re-fire the tile to cone 018.

Homemade Glaze Trailer

I use a homemade tool created from a nasal aspirator used for infants, a ball inflating needle, and a piece of masking tape. Clip off the end (approximately ½ inch) of the nasal aspirator so that you can just squeeze the inflating needle snugly in the opening. Inflating needles have a second small hole on the side; a small piece of masking tape wrapped around the end of the needle adequately blocks this hole. I like these homemade applicators because they are inexpensive, it is easy to replace the needle if it gets clogged, and I prefer the way the bulb feels—as if it's an extension of my hand.

Creating a Slump Mold with Styrofoam

by Ben Carter



Dogwood Oval Platter, 20½ in. (52 cm), earthenware, painted slips, sgraffito, and glaze, fired to cone 3.

An interest in creating a sense of value through decoration, along with the ability of that decoration to craft meaning led me to work with earthenware. This might seem contradictory, since earthenware has common and utilitarian associations, but the choice is based very much on the history of the material.

The perceived value of earthenware has shifted throughout time. As a variety of techniques were explored, the level of decoration and experimentation increased. Major aesthetic breakthroughs occurred in the wake of the attempt to mimic porcelain. By covering earthenware with white slips or glazes, the objects also benefited from associations that porcelain had in the culture.

Making Templates and Molds

I begin by making a template in the shape and pattern of the rim of the platter, creating the template using tarpaper. Tarpaper can be used repeatedly because it's impervious to

water. Cut the interior section of the template at both ends for easy registration on the form (*figure 1*).

Next, create a slump mold from stacked layers of closed-cell foam (the kind used for home insulation). The thickness of the mold depends on the depth of the recessed area required in the finished piece. I'd suggest making the mold at least 3 inches thick for strength. Mark the outline of the template onto the top of the stack. Individual sheets can be secured together using double sided tape. To create the recess in the slump mold, measure 1½ inches in toward the center from the two long ends and the two middle lobes of the outline and make a mark at each spot. Draw an oval connecting the dots, then use a serrated knife to cut out the shape.

Use the tarpaper template to aid in creating small cloth forms that sit on the rim of the foam mold (*figure 2*). The cloth forms are comprised of eight semi-circular sections that form a wavy rim for the platter. Make each cloth form using two pieces of canvas sewn together and filled with heavy grog. Pin the thinnest edge or point of the cloth form to the foam using T-pins (*figure 3*).



1 Create a tarpaper template of the platter. Make a stacked foam slump mold. Cut an opening in the foam 1½ inches in from the template's edge.



2 Use the tarpaper template to create a cloth mold that sits on the rim of the foam mold. Pin the cloth mold to the foam stack using T-pins.



3 Roll out a slab and trim it to the size of the tarpaper template. Place it so that the clay edge lines up with the edges of the cloth. Rib the slab into the mold.



4 Sandwich the removed oval section of blue foam, the cloth, and the platter (still in the slump mold) between your hands, then flip the piece.

Making a Platter

Cut a 3/16-inch thick slab using the tarpaper template. Bevel or soften the edges of the slab and use a soft rubber rib to compress each side of the slab in both directions. Place the slab onto the stacked cloth and foam forms so that the slab edge lines up with the outside edges of the cloth form. Work the slab into the form using a soft rib and working both from end to end and side to side (*figure 3*). The advantage of this form is the ability to bend the slab on more than one axis, so take time to work the clay down into the curves.

Let the slab firm up to a leather-hard. Place a bundle of soft padding and the section of blue foam that was removed earlier into the platter's interior. Flip the whole stack over (*figure 4*). Make sure the rim rests parallel to your work surface and is elevated a few inches above it.

Extrude, handbuild, or throw a ring to form the foot. Curve the wall of the foot into a slight "C" shape with the curve flaring away from the center of the piece. Try to match the volume of the foot to the volume of the rim. Allow the foot to set up to the same leather-hard consistency as the piece before attaching it by slipping and scoring (*figure 5*).

Slipping and Sketching

After the foot has set up and can hold up the rest of the platter without slumping, flip it over and remove the padding and foam. Smooth out any marks made by the foam. Apply a base coat of white slip to the bottom and rim. Apply the slip by pouring it into smaller pieces and spraying larger ones. You can also paint the slip on using a brush. Allow the piece to dry between coats. Brush the interior surface of the form with colored slip, about the consistency of yogurt (*figure 6*). Note: When slipping greenware pieces, it's very important not to load the piece with too much moisture.

Once all the slip coats have dried, sketch a pattern or design onto the interior of the piece with a dull pencil (*figure 7*). Sketch lightly so the composition can be easily painted over if desired.

Brush colored slips, the consistency of pudding, into the drawn pattern (*figure 8*). Create gestural movement with your brush and the thicker slip by making quick direct strokes. Work from dark to light colors, allowing the dark slip to show behind the lighter slip and ultimately creating translucency and depth.



5 Be sure the rim sits parallel to and several inches above the table. Add a foot to the bottom of the piece and allow it to firm up.



6 Apply a white base coat of slip to the bottom and the rim. Apply a thick, colored slip to the interior using a soft bristle brush.



7 Sketch a design or motif onto the interior with a dull pencil. Press lightly so that you don't scratch through to the clay below.



8 Brush lighter color slips into the patterns. Use one coat for a translucent effect and multiple coats for more opacity.



9 Achieve a thicker sgraffito line on softer clay with a dull pencil, and a thinner, more detailed sgraffito line on harder clay with a needle tool.

Use the sgraffito technique, scratching through the layers of slip to expose the clay body underneath. When fired, this dark line provides contrast to the lighter colored slips. If less contrast is desired, you may scratch through only the top layer of slip to expose the bottom layer. This line, whether high or low contrast, deep or shallow, works to sharpen the edges of the brush marks.

The timing of the sgraffito work affects the line quality. The moisture level of the clay should match the size of the tool. Start with the widest tools when the clay is a soft leather hard. As the pot dries, make finer lines with finer, sharper tools. For wide lines, use a chopstick sanded to a dull point. For small lines, use X-Acto blades and needle tools (*figure 9*).

Glazing

After decorating, allow the piece to dry slowly under a loosely wrapped layer of dry cleaner plastic. Dry larger pieces, like

platters, for about a week before bisque firing. As the piece is drying, apply two coats of red terra sigillata to the foot to enhance the color and shine. For a deep maroon terra sigillata, add 1 tsp. of crocus martis per cup of liquid. Burnishing after each layer of terra sigillata helps create a lustrous shine.

Since pieces longer than twelve inches in any direction have a greater chance of cracking during the bisque fire, lightly sprinkle the kiln shelf with fine sand and place the piece on top of the sand. The sand acts as a shock absorber and allows for horizontal movement, reducing the stress on the platter. Allow ample space above the piece to promote even heat distribution, which helps avoid cracking in low, wide pieces.

After bisque firing, apply a transparent amber glaze over the interior of the platter. Apply a satin glaze to the rim and underside of the platter to provide contrast with the high gloss of the interior. Glaze fire the piece to the appropriate temperature for your glaze.

Making Bisque Molds with Texture

by Nancy Zoller



Round convex maple leaf platter, 13 in. (33 cm) in diameter. Photo credit: Jafe Parsons.

The way that clay stamps can activate and transform the clay surface has been a constant source of fascination to me, helping my work evolve and grow over the last three decades. I've worked with traditional, impressed designs, and more recently with raised designs created via a two-step process.

The platters with raised patterns are created using a hump mold and slab construction. First a pattern is stamped into a slab that's been draped over a form, then this slab is dried and bisqued to create the mold.

The surface designs on the mold create a convex, or raised pattern rather than the typical concave surface achieved with stamps. I came up with this idea a few years ago after becoming frustrated with the way traditional stamped patterns did not hold up when using drape molds. I wanted to make utilitarian forms that were elegant, had fine detail and could be reproduced. It was also essential to me that making these pieces kept my joy for working with clay alive!

Finding Mold Forms

There are never-ending sources of forms all around us to use as base shapes. Plastic or metal mixing bowls and even a solid centered mound of clay shaped into a low, gradually curved form and dried to the leather-hard state will work.

The form must function as an exterior drape or hump mold.

If you find an interior shape you like, simply make a plaster mold using #1 Pottery Plaster. Be sure to spray the interior of the form with cooking spray or coat with Vaseline or A&D ointment as a release agent, then pour the plaster inside the form. Remember that plaster expands slightly as it hardens, so it's best to avoid making a mold of anything too fragile.

To make large platter molds, I first create a plaster mold using a Slump Hump form, which is a plastic mold form that can create both slump molds and hump molds. Slump-Hump forms are available in a variety of shapes and sizes at ceramic supply companies.

Making the Bisque Mold

Once you've found or made a drape form, you're ready to start making your bisque mold on top of it. Roll out a slab of clay about ¼-inch thick and place it over your drape mold (figure 1). If your drape form is glass or metal, place a piece of plastic wrap between the form and the clay to keep the slab from sticking. Cut and smooth the bottom edge so that it's a straight, even and level line, following the base of the form.

Stamp into the clay surface as if you were making a piece with a concave, design (figure 2). Make your own clay stamps or use items from nature such as shells, pine cones, and leaves. Using a wheel and a ribbon or loop tool, carve borders or defining lines to frame in your design. Remember



1 Lay a ¼-inch slab over the exterior drape mold and trim the excess following the base of the form.



2 Stamp into the form, using hand-made bisque or plaster stamps or found objects.



3 Add a throwing spiral with a metal rib and create emphasis with a small leaf stamp. Dry and bisque fire.



4 Drape a ¼-inch thick slab over the bisque-fired mold and trim the excess following the rim.



5 Firmly roll a small hand roller from the center of the slab to the outside edge. Cut at the base of the form.



6 Center the mold on the wheel, make marks for the foot ring and extrude a ½-inch coil for the foot.

that whatever is carved into the clay will be raised and reversed in your future piece.

If the mold is round, place it on the wheel, center it and secure it with lugs of clay as you would when trimming and use a metal rib to create a spiral in the middle giving it a “thrown” appearance if you wish. Usually, a small leaf finds its way into the interior of the design on my work (figure 3). Once you’ve finished the design work, wait until the piece is leather hard and remove it from the mold. Let the form dry slowly, then bisque fire it.

Final Convex Piece

Roll out a slab of clay and place it over the bisque mold (figure 4). With a small hand roller firmly roll the clay from the center of the mold out toward the edge (figure 5). Use a rubber rib to smooth this surface after rolling. Cut and smooth the bottom edge with a needle tool following the base of the mold.

At this point, you can extrude a ½-inch thick coil to add a raised foot to the form. The clay and the coil need to be the same wetness. If the form is round, place the mold on the wheel, center it, and secure it with clay lugs, and throw the foot. Using your pin tool, make two concentric circles about a half inch apart while the wheel is spinning to indicate where you will place the coil. Place the coil (figure 6), then press downward on the inside and outside of it to adhere it to the base surface. Once it’s fastened, firmly give the coil an

upward pull to create height, then smooth the surface with a chamois or sponge (figure 7).

To add the coil to an oval, square or oblong form, simply eyeball where you want it. Lay the coil down and be sure to bevel the edges where they join to secure the connection. Use a flat wooden tool to smooth the coil on the inside creating a secure join. When the coil is secured, smooth the transition between the coil and pot with a rubber rib (figure 8). Use similar clay stamps on the outside of the foot to tie the patterns together (figure 9).

Revealing the Finished Piece

Clay dries and releases very quickly on a bisque-fired mold, which allows for several pieces to be made on the same mold each day.

When the platter is leather hard, pop it off of the mold. At this point, clean up the outer edge with a fettling knife. The outer edge can be a straight line or follow the contours of the stamped shapes (figure 10). After cutting, smooth the edge with a sponge. I sometimes add slip-trailed elements or do more carving on the surface of the piece. Adding handles to larger pieces enhances the form and makes them easier to use. Since you’ve already added a foot, the piece is now complete.



7
Press down on the inside and outside to attach the coil, then pull up to create the foot. Smooth with a sponge.



8
For a square piece, attach a coil foot and smooth the inside transition with a rubber rib.



9
Stamp the outside of the coil with stamps similar to the shape on the mold to create continuity.



10
Carve the edge of platter with a fettling knife to accentuate the stamped motif.

Glazing

Semi-matte, shiny, or transparent glazes work best in highlighting the raised surface design on these pieces. I use one glaze on the whole piece, then brush another accent glaze or stain onto the leaves, shells, etc. Spraying or dipping the piece all at one time with no glaze overlapping is best, as overlaps create lines that will distract from the raised pattern.

Final Thoughts

Creating and using these molds offers me endless possibilities. As a pottery instructor, it assures quick success for the most novice of my clay students. In addition to helping beginners, this technique presents an excellent road into exploration when used by seasoned clay artists as well.

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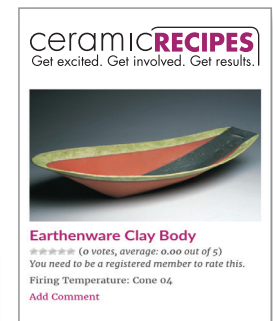
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