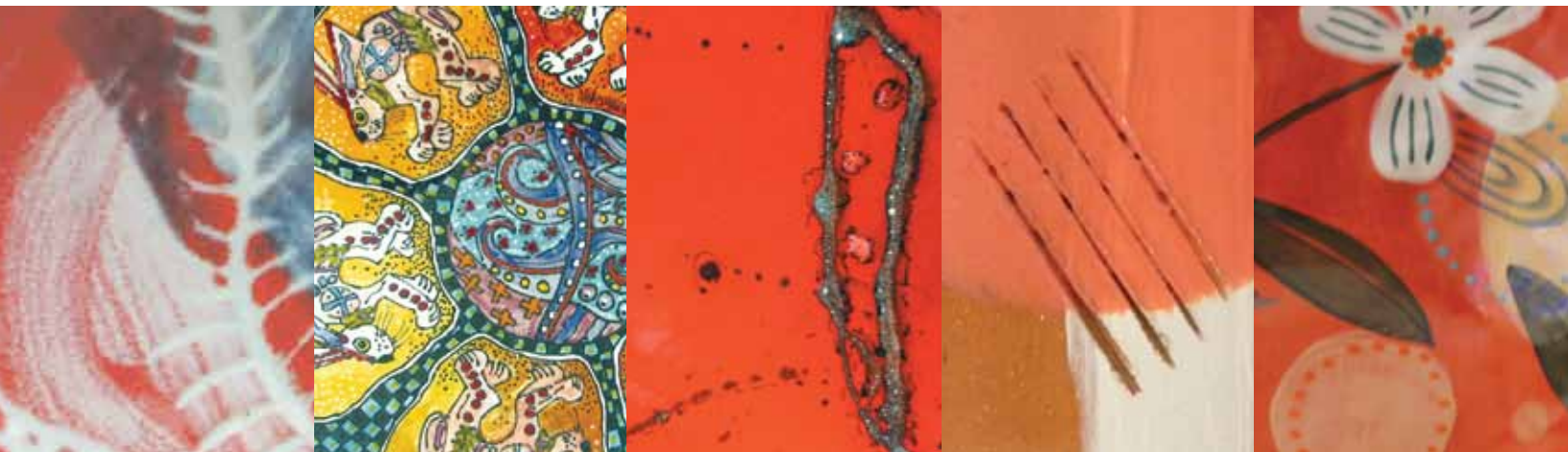


# getting the most out of ceramic glazes and underglazes



using commercial ceramic glazes  
and underglazes to achieve  
color, depth, and complexity

# Getting the Most out of Ceramic Glazes and Underglazes

## Using Commercial Ceramic Glazes and Underglazes to Achieve Color, Depth, and Complexity

Ceramic glazes and underglazes are varied and wondrous concoctions. Because they can be complex, as well as for ease of use and time savings, most of us use commercial ceramic glazes to some extent. Chances are, even if you are a ceramic glaze mixing master, you have a few commercial ceramic glazes or underglazes around the studio for specific pottery applications. Maybe you want to rely on commercial glazes for your liner glaze, so you're sure it will be food safe, or perhaps a commercial ceramic glaze provides that hard-to-formulate color you need for details in your surface decoration.

***Getting the Most out of Ceramic Glazes and Underglazes: Using Commercial Ceramic Glazes and Underglazes to Achieve Color, Depth, and Complexity*** provides several approaches and techniques to successfully identifying, applying and firing commercial ceramic glazes.

### A World of Color

by David Gamble

Underglazes are one of the most popular ways to add color to clay surfaces. They're easy to use, and underglaze colors are pretty much a "what you see is what you get" kind of proposition—blue fires blue and orange fires orange. The best part is that underglazes come in all forms like underglaze pens, underglaze pencils, underglaze crayons, and more.

### Homemade Underglazes

by Holly Goring

Underglazes are widely available but if you're adventurous, you may want to try to mix your own. Holly provides a basic recipe and instructions for creating your own underglazes and the special instructions required for success.

### Creating the Layered Look with Commercial Glazes and Underglazes

by Nancy Gardner, with Burt Isenstein

Nancy Gardner loves commercial glazes and underglazes because the color choices are virtually unlimited. In this article she shares how she and her husband Burt layer them up to create bright and beautiful floral designs on her pottery.

### Using Ceramic Underglazes

by David L. Gamble

Commercial underglazes are a great way to add color to your work using a variety of application methods. They're formulated to have low drying shrinkage, they can be applied to bone-dry greenware or to bisque-fired surfaces. In addition to being able to change the surface color of your clay body, underglazes can also be used to change the texture of the body.

### Creating Depth with Ceramic Glaze

by Lisa Bare-Culp

There are many ceramic glazes that look great all by themselves, but you can really bring your own style and voice forward when you start using techniques like pouring, carving, and layering to create depth in the ceramic glaze surface.

### Low-Fire Red Glazes

By David L. Gamble

If you have ever tried to formulate a red glaze, you know how difficult it can be. But even if you buy commercial red glazes, you understand that they need a certain amount of attention and precision paid to them during application and firing. This article will help you understand and keep track of all the variables when applying and firing red ceramic glazes.

# A World of Color

by David L. Gamble



**Underglazes are the most versatile of products for the clay artist. Available in more than 1000 colors, underglazes come in both dry and liquid form as well as pencils, crayons and chalk.**

them adhere to ware and also add some green strength. If you decide to purchase dry underglaze, you may also need a mixing medium, for example, Standard Ceramics specifies mixing one part colorant and one part mixing medium. The medium adheres well and creates a harder surface than water so there is less smearing if you're working on bisque and placing a clear glaze on top before firing.

Underglaze pencils, crayons and chinks vary depending on the manufacturer. They're designed to be used on bisqueware because rubbing them onto a fragile greenware surface can break the greenware. Pencils produce a nice pastel or a pencil-type effect depending on how smooth the clay surface is. Many are very dry and break easily during application, and most are imported from outside the U.S. Some pencils contain waxes to help them adhere to a bisque surface, but these need a clear glaze on top to keep them from rubbing off after they're fired. Caution: Never put underglaze pencils in an electric pencil sharpener.



**Test all underglazes for your studio conditions—clay body, firing, overglazes, etc. Create test tiles with samples and apply a clear overglaze to half the swatch. You'll find the colors deepen in value with a clear glaze.**

Underglazes are one of the most popular ways to add color to clay work. They're easy to use at any age or skill level and they can be applied at both the green and bisque stage of work. Underglazes come in many forms—liquid, powder, pencil, crayon, liquid writers, bottle applicators, underglaze pads, watercolor-type pan sets and tubes. Typically, liquid underglazes contain gum or binders to help them adhere to ware and also add some green strength. If you decide to purchase dry underglaze, you may also need a mixing medium, for example, Standard Ceramics specifies mixing one part colorant and one part mixing medium. The medium adheres well and creates a harder surface than water so there is less smearing if you're working on bisque and placing a clear glaze on top before firing.

Many companies offer underglazes by different brand names, but they all pretty much function the same way. Underglazes come as premixed liquids or dry, large and small

quantities, and in different formats, such as crayons, pencils and pens. If you're not sure what you'd like to do, order 2 oz. bottles and experiment before you invest in pints or gallons. Here is a partial listing of offerings, but remember that most of the companies listed here sell their products through distributors. For more information, go to the company websites or check with your local supplier.

Company	Product	Colors	Cone
Amaco	LUG	24	06-5
	Velvets	59	06-5
	Velvet One Strokes	12	06-5
	Sun Strokes	6	06-05
	Semi-moist (pan)	48	06-5
	Pencils	6	06-5
	Chalk Crayons	16	06-5
	Tubes	48	06-5
	Engobes	9	05-6
A.R.T.	Glazewerks	34	06-04
Axner	Pencils	15	06-5
	Pens	27	06-5
ChromaColour International	Underglaze	100	06-05
	Underglaze	50	6
	Underglaze	63	10
	Speckled		
	Underglaze	12	06-05
Continental Clay	Underglaze	40	06-6
Coyote Clay & Color	Underglaze	25	5-10
Duncan	CoverCoat (opaque)	7	06-5
	E-Z Stroke (translucent)	69	06-5
Gare	Underglaze	55	06-5
	One strokes	21	06-5
Great Lakes	Underglaze	24	06-6
Kickwheel	Underglaze	12-18	
Laguna	EM Underglaze	72	06-6
Mayco	Underglaze (opaque)	70	06-5
	One Strokes (transparent)	32	06-5
Minnesota Clay	Underglaze	16	06-9
	Underglaze Pads	8	06-8
	Choxilis Pencil	10	06-8
	Potters slip	10	06-9
Rovin Ceramics	Underglaze	12	06-8
Spectrum	Underglaze	70	06-5
	One Stroke	40	06-5
Speedball	Underglaze	24	06-6
Standard Clay	Underglaze	23	06-5
	Underglaze Painting Medium		

# Homemade Underglaze

by Holly Goring

The truth is, I was a nerdy ceramics undergraduate student. I wanted to learn everything, right away—and I loved my glaze calc class. No, really, I did. I took a ridiculous amount of notes and then put them all in plastic sleeves in a binder. I'm sure I tested every recipe I could find or invent. After discovering commercial underglaze, I was sure I could make that too.

Smooth, silky, perfectly opaque, commercial underglaze is that wonderful substance that coats and colors both greenware and bisque ware with ease (I've even seen it work on mature cone 04 earthenware), and without flaws. And, in terms of color, what you see is what comes out of the kiln, no guessing, no hoping. They are dependable as well; covering large areas quickly with smooth and consistent brush painting. They take light-colored, transparent or clear glaze very well without dissolving into the glaze during

the firing. Finally, commercial underglaze fires into a hard, unscratchable surface without pinholing or flaking from cone 04 all the way to cone 10.

## Commercial Underglazes

Today, most commercial underglazes are formulated using frits, which reduce shrinkage, allowing them to be applied to both greenware and bisqueware. They are produced using a colloidal process. A colloid is a substance microscopically dispersed evenly throughout another substance (think mayonnaise or hand cream). Underglaze manufacturers use a chemical process that employs a high-shear mixing technology to create colloids. The substance created does not settle and cannot be separated out by ordinary filtering or centrifuging like those in a typical suspension. This allows for complete integration of all raw materials, including the colorant, during the base mixing stage.



Underglaze applied over red earthenware. White slip was applied to half of the test tile before bisque firing. This is noticeable in the white, orange, and red tiles where the application was thinner. See recipe on next page.

## Developing the Recipe

Variations of underglaze recipes were available on the Internet but not much could be found in textbooks, beyond iterations of slips (clay suspended in water, formulated to fit either to wet or dry greenware) and engobes (generally a lower clay content, most often fits greenware and bisque ware). Few of these recipes encompassed all the characteristics I was looking for—something similar to commercial underglaze. Not too much to ask, right?

I started by choosing a clay and a flux. I needed a fairly heavy clay content for adhesion to the clay body, and an equal amount of flux to lower the melting point of the silica, and to create a hard surface. My clay choices included: EPK kaolin, calcined kaolin, OM-4 ball clay, and talc, all fairly white firing as to not add to the color, and each contributing something different to the adhesion needed. My fluxes consisted of: Ferro frits 3124, 3134, and 3195, a good place to start in terms of readily available frits. Then in a radical move, I ignored all previous instruction and treated the colorant as one of the base ingredients. This allowed for full incorporation of the color with the other two ingredients during the mixing of the base recipe. I used commercial stains in order to get an opaque quality (I later tested variations with oxides that resulted in a somewhat transparent underglaze.)

I mixed 1000 gram batches in a thousand variations (or something close to that). I actually mixed three batches of each recipe to test gums and suspenders, without which, any substance mixed from the above ingredients would settle to a rock-hard mess and be nearly impossible to brush onto any clay surface. I tested CMC gum (powder, premixed into a liquid), premixed bentonite, and Sta Flo laundry starch (a tip from one of the internet recipes).

Not having the ability to replicate the colloidal process, I sieved and ball milled each recipe in order to fully integrate the raw materials and to reduce the particle sizes as much as possible.

I tested each glaze on leather-hard, bone-dry, and bisqued earthenware and stoneware test tiles. I fired the earthenware tests to cone 04 and the stoneware tests to cone 6 and cone 10, all in an electric kiln.

After many firings and many eliminations, this recipe came very close to replicating commercial underglaze:

### Holly's Underglaze

Cone 04–10

Ferro Frit 3124 .....	33.3 %
EPK Kaolin .....	33.4
Commercial Stain .....	<u>33.3</u>
	100.0 %

Sieve all materials with an 80-mesh sieve and then ball mill for at least 12 hours. Incorporate Sta Flo Laundry Starch until the mixture reaches a thin yogurt consistency and sieve the entire mixture again.

## Pros and Cons

The results were good, very good—smooth, creamy, good adherence, versatile at all temperatures, a hard surface, and an intense color. The underglaze worked well on both clay bodies and in all stages, but was best on bisque ware. Brushability was best with the Sta Flo. I found that too thick of an application caused flaking and pinholing. The lack of sieving and ball milling did the same. If mixed to the correct consistency, one coat was sufficient while two coats often was too much. The colors became muted when fired to cone 10 but still held up in hardness and adhesion. Only small batches could be mixed at a time due to the inclusion of the Sta Flo, which is organic and caused mold to grow in the bucket within a few days. The mold could be skimmed off but added unwanted lumps if it wasn't all removed. And of course the amount of commercial stain used to produce the rich colors similar to commercial underglazes was ultimately very expensive. In the end, mixing this homemade underglaze was a lot of work for a product the manufacturers do just a bit better, faster, and cheaper. However, if I want colors that aren't available commercially, now I know how to make them.

# Creating the Layered Look with Commercial Glazes and Underglazes

## Commercial Colors

Commercial glazes are unlimited for possibilities—pinks, bright yellows, crazy greens, and lots of red that wasn't at all fugitive. No more glaze testing. I went with commercially available materials and have never looked back. For years I used a white talc body, then in graduate school I switched to red earthenware because of its warmth and beauty.

My husband, Burt Isenstein, works with me in our pottery business and is the one who has figured out the current glazing process. The commercial underglazes we use are a mix of Amaco, Duncan, Reward, and Great Lakes products. The Amaco white underglaze is used to lighten darker colors because the clay makes them too dark. I blend the colors by eye and can tell through experience what they will look like when glazed and fired.

## Base Coating in Layers

When the form is completely dry, begin the painting process. Hake brushes are best for the initial coats of underglaze (*figure 1*). They come in many grades but it's best to splurge a bit as the cheap ones fall apart and leave bristles all over the work. Because red earthenware is so dark, it takes several coats of underglaze to get good coverage. Particularly with brighter colors, apply 3 to 5 coats. It's a good idea to slightly vary the colors in each layer for this initial stage; for a red bowl, paint one coat with a light red, then a coat of red mixed with salmon, then apply a red-orange mix, followed by two layers of red for the final coats. This gives the surface some depth along with good coverage. You can experiment with how thick to make each coat. If you go thinner, you might get some iridescence from the layering, especially from the blues and greens. When working on greenware, the underglazes dry almost instantly, so you can go from one coat to the next without much waiting in between.



## Adding Decorative Elements

The next step is to initiate additional design elements. This can be stripes, dots, or splitting the surface into other areas of color. The bottoms of my bowls are striped. I use the width of the brush to establish the thickness of the stripes (*figure 2*). The outer stripe nearest the rim is the same as the interior color, followed by a contrasting color. I leave the area surrounding the feet bare and separate this area and the stripes with another contrasting color (*figure 3*). This same contrasting color is applied around the bowl's rim in a thin stripe.

When adding pattern or decorative elements to a red piece, it's a good idea to choose warmer colors—yellows, oranges, or lighter reds to give some liveliness to the pattern. Watercolor brushes work well for this, starting with larger ones and getting progressively smaller as the detail work demands. The decoration usually consists of two or three repetitive elements.

Start with large yellow circles followed by smaller pink ones (*figure 4*). Then add white flowers that over-



1 Use several shades of the same color to achieve depth of surface when brushing on the background colors.



2 Break up the surface into separate bands and draw a thin line of a complimentary color to separate the bands.



3 Finish the background on the underside of the bowl with multiple coats of each color.



4 Apply a first layer of pattern to the interior using colors from the same family so they blend together.

lap and intersect with the circles. The overall pattern appears to go beyond the boundary of the rim, similar to wallpaper or fabric, which brings the viewer's eye around the piece (*figure 5*).

## Depth in the Details

Next add green stems and leaves to the flowers (*figure 6*) and thin, blue, graphic elements to the petals and surrounding area to fill in any overtly blank areas (*figure 7*). The stems act as connectors for the bigger flowers, while the blue graphics add depth.

For inspiration, I look at all kinds of art that involves pattern, including fiber, painting, folk art, and botanical illustration. Large elements lead to details, sometimes black outlines for emphasis, sometimes just a shadow line. Often the back is split, with a different pattern on

the bottom half or third (see *figure 9*). The last bit of detailing is painting black checkers on the green stripe around the rim (*figure 8*), then adding thin black lines over the white band around the foot followed by more tiny black checkers (*figure 9*). I also paint on my potter's mark in the center of the foot.

## Firing and Glazing

Bisque fire the bowl to cone 04. A slow bisque is important for success with low-fire clay bodies as it completely burns out and eliminates carbon and impurities that will cause glaze flaws.

I use Amaco Clear Gloss glaze over the unpainted areas of my pieces. My general rule of thumb for glaze application is to brush several thinner applications using a soft, wide, watercolor brush. I thin the glaze with water so it covers the ware evenly, but I can control the



5 Several coats of white underglaze are needed when painting a pattern over the red or other dark underglaze colors.



6 Leaves add complexity to the pattern, especially when overlaying other patterns.



7 Additional foliage and other design elements are added to increase depth and add interest.



8 Outlining with black underglaze pulls out the main pattern. Design elements such as polka dots draw the eye around the piece.



9 Repeat the main pattern on the back rim along with additional details such as stripes, tiny checks, and a signature.



Voila! The finished footed bowl, glazed, fired, and ready to be used.

thickness. It's critical that the glaze dries thoroughly between coats to maintain an even thickness. If glaze is applied too thickly, it tends to bubble or crawl.

I use Duncan Satin Clear glaze over the painted areas. Satin glaze must be applied in three thin coats. If it's too thick, it goes milky and obscures the color and detail underneath. The satin glaze opacity interferes with dark colors, like red or black, and I usually mediate the satin glaze opacity (on dark colors) with an initial thin coat of gloss glaze, then two coats of satin on top. I fire glaze ware to cone 05 with a 15-minute soak period at peak tempera-

ture. My glaze firing takes approximately 7½ hours.

As anyone who has worked with clay for a while knows, a production formula that works for one potter may not work for another potter. One always has to be prepared to experiment with materials to develop and maintain an individual process and style.

*Nancy Gardner received an MFA from Southern Illinois University. Burt received an MFA from the School of the Art Institute of Chicago, where he's currently an adjunct assistant professor. Together they own and operate Nancy Gardner Ceramics, [www.nancygardnerceramics.com](http://www.nancygardnerceramics.com).*



# Using Ceramic Underglaze

by David L. Gamble



**Teapots by Jim Kemp.** Jim uses a low-fire red clay body and airbrushes underglazes onto the greenware. The last color he applies is black, which is sprayed across the piece to highlight the variations in heights of the surface decoration. The pieces are once fired to cone 02.

Commercial underglazes are basically clay slips containing colorants, and they're a great way to add color to your work using a variety of application methods. And since they're formulated to have low drying shrinkage, they can be applied to bone-dry greenware or to bisque-fired surfaces. In addition to being able to change the surface color of your clay body, underglazes can also be used to change the texture of the body.

When used to add color to surfaces, underglazes have an advantage in that they are composed mostly of clay with very little flux, so they'll stay put and won't run, which makes them ideal for detailed decoration. While most underglazes were originally formulated for use at low-fire temperatures, most maintain their color in the mid range and some even as high as cone 9 or 10.

## Simple Application

Underglazes can be applied by brushing, pouring, dipping, spraying, sponging—pretty much anything goes. Each application method has different requirements. If an underglaze is too thick for spraying or using as a wash, just add water to thin it down. If it's too thin for silk screening or monoprinting, leave the container exposed to air to evaporate some of the liquid.

Underglazes work best with a clear overglaze, although other glazes of varying opacity and color may also be used. I've had success with whites and very light-colored glazes, but darker glazes seem to muddy or absorb the color of the underglaze. The overglaze can be anywhere from matt to glossy. You'll find the clear deepens the value of the colors regardless of application method. If you're sealing the surface of work that will come in contact with food, be sure to use the appropriate food-safe clear that matches your clay body and firing range.

Applying an overglaze can be tricky. If you've applied underglazes on bisque, you'll find that they'll smear when brushing on a clear overglaze because moist glaze moistens the underglaze. Use a fan brush and float the first coat on without going over the same area twice. Wait for the first coat to dry completely before brushing on a second coat.

I've recently used underglazes to create a watercolor effect by thinning them down and painting them onto a semi-white glaze that is layered over another colored glaze underneath. The colored glaze (sometimes gloss, sometimes matt) melts through the white and gives it a richer off-white look. The clay body is a red terra cotta that can handle a number of multiple firings if needed. I've been creating pieces from my travel sketches to permanently document places I've traveled to in a sketchbook-like manner.



**3 Women Praying by Debra Fritts.** Debra sculpts in terra cotta clay and bisque fires to cone 02. She covers the piece with black stain then underglazes are applied, wiped, scraped, and fired to cone 04. She continues with final glaze additions and fires to cone 05.



Rimas VisGirda slab builds his plate forms from a terra cotta body. Following a pencil outline, he brushes on underglazes then applies wax to the entire surface. He redraws the figure and the outer border by scratching through the wax and into the clay surface and then inlays liquid black underglaze into the scratched lines. After bisque firing to cone 05, he waxes the figure portion and outer edge again but leaves the background alone. After sketching in flowers with a pencil, he applies underglazes to the flowers, leaves and stems and further defines them with black underglaze. He applies wax over the flower stems and leaves then sponges blue underglaze onto the background. After firing to cone 5, he adds shading with an underglaze pencil then fire to cone 3.

## Testing the Limits

Through their testing, clay artists have been very influential in the increased use and relabeling of underglazes. When they successfully experimented with firing underglazes above the recommended cone 06 to a cone 5 with little or no change in color, manufacturers relabeled their products to reflect the change. The hobby industry also helped promote higher ranges by developing a line of cone 5 casting porcelain, meaning more potters were working at higher temperatures. Even though the majority of underglazes can survive a cone 5 firing, usually resulting in a more vitreous surface, always test before using them on your artwork.

Through the years, my friends and I have done many tests, taking underglazes to cone 10 in different atmospheres. Many of the underglazes change color and most become very vitreous, even glossy, without a clear glaze over top. I've even fired some underglazes at cone 11 and 12 in Europe with nice results.

At the University of Indianapolis, Dee Schaad mixed some of the new bright red and yellow underglazes into a cone 10 clear glaze in a ratio of three parts clear to 1 part liquid underglaze. He then brushed the mixture on top of various cone 10 reduction glazes, including a temmoku, with great results—the bright colors stayed bright. When potters told me that the new bright reds that fire to cone 10 blush out to white, it made me wonder if mixing them in a clear glaze would help protect them from the salt when salt firing. Experimenting with all these colors allows you to find new and unexpected results when testing in, on and under anything you have on the glaze shelf.

One thing to remember, however, is that if you're using underglazes at a higher temperature than recommended, things can change. One clay artist using a black underglaze at cone 10 noticed that the next pint she opened looked the same in the jar but had a very greenish cast when fired. The company told her they had to reformulate because of government regulations and material availability and reformulated the color to fit their cone 06 to 5 suggested firing temperatures. The higher cone 10 temperature was overlooked and not taken into consideration.



**In this example from my *Sketch Book Travels*, series, I bisque fired a clay slab to cone 03 then layered base glazes—3 coats of key lime with white, and 3 coats of low-fire white on top. The sketch is then executed with thinned out underglaze washes and fired to cone 04.**

Paul Wandless paints underglazes on plaster in reverse, painting the foreground first and the background last. He then pours a low-fire white slip on the plaster. This picks up the underglaze image and inlays it into the clay. After bisque firing to cone 02, he applies a thin clear glaze then glaze fires to cone 04.



Ron Korczycki bisque fires a white low-fire clay to cone 04 then applies underglaze by brush on the bisque piece. He uses many underglaze colors in different size applicators that he can squirt out and draw line details and dots of color. The final piece is fired to cone 05.

Tom Meunick uses white stoneware or porcelain then bisque fires to cone 06. He then uses underglaze pencils to draw on the surface. After drawing, he atomizes it lightly with water then applies a glaze by dipping or spraying.



# Creating Depth with Ceramic Glazes

by Lisa Bare-Culp



*Fish Bowl*, matt white glaze over commercial glazes, fired to cone 6.

**A**s a potter and in-home instructor for many years, I've always mixed my own glazes, or relied on other professionals who mix dry glazes to my specifications. Recently, an idea for a single pot challenged me to experiment with commercially-made glazes. The outcome has been successful with vibrant new color selections, time savings and the convenience of readily available glazes screened for toxicity—all this without compromising my workspace or my standards.

What changed my thinking on commercially prepared glazes was my desire to introduce bold new colors into my work. I envisioned a piece with contrasting matt black-and-white slip surfaces offset against a single area glazed in vibrant red. My local supplier recommended a food-safe, nontoxic red glaze, Mayco's Stroke & Coat Cone 06.

## Early Experiments

Early tests resulted in pieces with dramatic and beautiful contrasts between my porcelain slips and the red glaze. In one test, I used Stroke & Coat SC-73 Candy Apple Red, to highlight areas of bisqueware. In another, I used SC-74 Hot Tamale. Sometimes I applied the glaze with a big brush in a single, expressive stroke. Other times, I squeezed the colors from a slip trailer and a turkey baster.

After these loose applications, I dipped the entire piece in my usual cone 6 glazes. Because of their gum content, the commercial glazes resisted my glazes slightly, making the bold strokes of color come through vividly. Stroke edges were blended and their colors softly striking against the cone 6 palette. The outcome was as satisfying technically as it was aesthetically; I

was satisfied with the melt (Stroke & Coat is a glaze, not an underglaze), the color and the absence of pinholing or other major flaws at cone 6.

## A New Tool

Further experiments with sgraffito, layering, mixing with slip and stoneware glazes, and multiple firings have opened up commercial glazes as a new artistic tool—albeit an unexpected one—to share with students. They have learned the importance of experimenting with new surfaces, new materials, combining techniques and achieving balance with different kinds of material.

If you'd like to experiment with commercially prepared glazes, I've included three of my projects for you to try. Mixing my own recipes will always be an important part of understanding the science behind the art of pottery making. But successfully integrating commercial glazes in the mix is just one more way to pursue the function and beauty of ceramics.

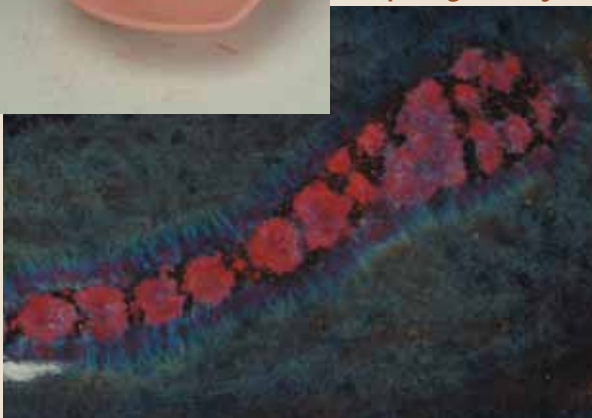
## Pouring

Squeeze a large amount of Stroke & Coat SC-73 Candy Apple Red across the interior of a bisque-fired bowl. Use a 2-inch brush to apply a thin coat of Mayco's Elements Chunkies EL 203 Coal Dust (this is a low-fire effect glaze with crystals) over the Candy Apple Red.

A nice feathered edge is created when the piece is dipped into a cone 6 black glossy glaze.



Asparagus Tray



## Carving

Apply a thick coat of Mayco Stroke & Coat SC-71 Purple-Licious and SC-74 Hot Tamale with a large brush to the interior surface of a leather-hard bowl. Once the colors are slightly dry, the design is carved through the glaze with a loop tool, then bisque fired to cone 08. Dip the entire piece twice in a cone 6 matt white glaze and fire to cone 6 in oxidation. The commercial colors show well through the white matt.

Note: If the carved lines are too fine they may fill in when the glaze melts.



## Fish Bowl



## Gear Dish



**Gear Dish, slab-built stoneware.**

## Layering

On a heavily textured, bisque-fired piece, apply a cone 6 porcelain black slip as a stain, wiping off the high spots with a damp sponge.

Use a 2-inch brush to apply Stroke & Coat SC-71 Purple-Licious to the high spots with a dry brush technique. Next, dry brush Mayco's Stroke & Coat Red SC-74 Hot Tamale and SC-27 Sour Apple onto the interior. Apply a thick coat of the red glaze in isolated areas to obtain a bright color.

Apply wax resist to the interior surface of the piece and allow to dry. Dip the entire piece in a cone 6 blue glaze.



# Low-Fire Red Glazes

by David L. Gamble



**Above: Plate, by David Gamble. Cross is glazed with red underglaze.**



**Left: Untitled, by Scott Bennett. Amaco LM series Coral glaze with wax and Black overspray. As the wax melts in the kiln, the black moves.**

I'll start by explaining there are two different types of commercial red glazes that I normally use.

One type is an extremely bright color and harder to achieve and the other is a newer tomato red color that is AP (Approved Product of the Arts and Creative Materials Institute) nontoxic and dinnerware safe. The latter is formulated with inclusion stains, which are continuing to be improved. The color is encased in zircon, which makes them safe to use even in the classroom.

The AP nontoxic reds are extremely stable and were used to create red velvet underglazes that can be fired from cone 05 to as high as cone 10—only salt seems to blush them out.

The success of underglazes has allowed the development of gloss and matt red glazes that have been formulated to work well at the low-fire cone 05 range and other glazes formulated for the cone 4–6 range. These are extremely reliable. Three brushed coats will usually be enough of an application and you get nice tomato color reds at both temperatures.

Bright reds are not dinnerware safe and are extremely sensitive to variations in firing conditions. There have been many times that an art teacher has asked me about the use of these types of red glazes. I understand the space and time challenges that teachers face, but you cannot put these glazes in with your normal glaze firings and expect good results. They are affected by how tight the load is stacked, other glazes (mostly copper greens), and temper-

ature. If you're firing to cone 05, I can almost guarantee there will be problems. The glaze will most likely have variations from clear to gray to black, and if you're lucky, a spot or two of red.

Note: Amaco glazes were used in the pieces shown here, however, many companies produce similar glazes.

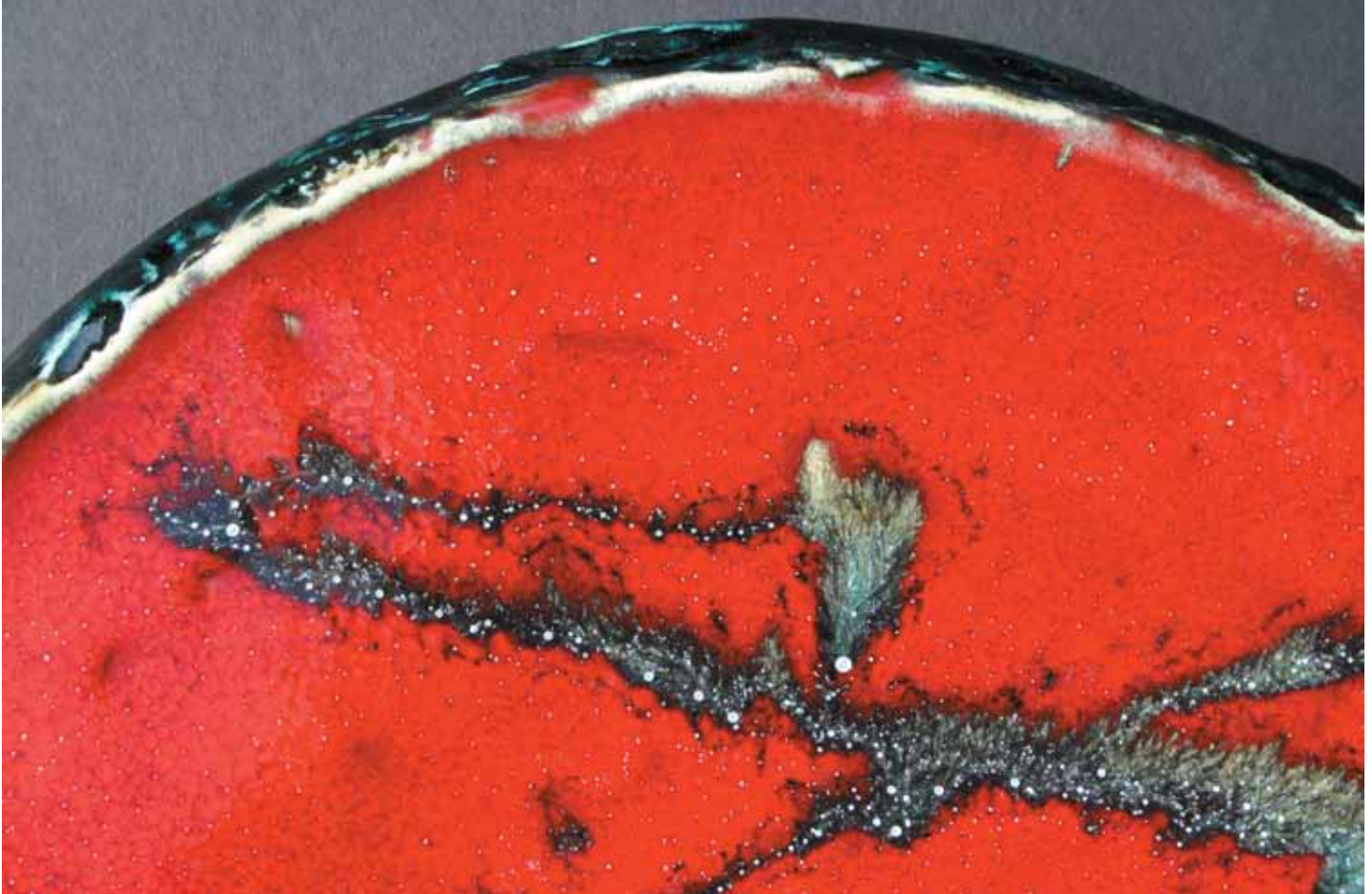
## Process

Here are my suggestions of what you need to know and do to achieve the bright reds!

Bisque your clay body slowly to cone 04 (12 hours to get all the gases out). Although these glazes are not considered translucent, the clay body color does affect them slightly. White bodies will make the glaze appear brighter in color than darker bodies.

Using a brush, apply the glaze thicker than the normal three coats. Four coats will usually work, but too heavy an application may cause the glaze to run. Glaze application may need experimentation and practice.

Load the kiln very loosely. There is a need for lots of space between the pieces for air circulation. I leave the



**Platter, by David Gamble, glazed with red glaze, blue brush strokes, and one coat of gold used for accents.**

peephole plugs out during the firing, thus allowing extra oxygen to enter the kiln chamber.

Do not fire above cone 06 (1828°F), preferably using witness cones for observation. I have been firing at cone 07 (1789°F) with great results. These glazes seem to like the cooler temperatures.

Fire as quickly as you can, four hours is ideal. If your pieces are larger, an example being my 22-inch platters, take them up slowly to about 1200°F. This may help to eliminate cracking problems. Then turn the kiln on high to fast fire to the end of the firing.

## More Observations

If your kiln is vented through the bottom with a system that draws air through the top of the kiln, this will help give you more oxygen in the kiln and better red results. Remember that kilns, depending on how they are stacked, may not fire that evenly. This can cause cold spots and hot spots. There can be a difference in temperature equal to a couple of cones from top to bottom—depending where the kiln sitter or thermocouple is located. This variability can really affect bright red glazes. Newer kilns with zone control and multiple thermocouples tend to fire more evenly. If you have an older kiln, place cones in the top, middle and bottom of the kiln so you can keep a record of what happens in the firing. They can help provide answers if problems do occur.

Now that you know the process, I will describe my experimentation with red glazes. I've been placing them on different color clay bodies, layering over glazed fired

pieces and layering one coat of gold glaze over the top.

I then place the pieces next to peep holes to brighten the color or place shelves over the edges to deepen and take away the color. This is what is exciting to me—not getting it perfect, but having the surface color change and vary while having some control over what the changes will be. I am an extreme advocate of using commercial glazes the way a painter would use his tubes of paint. Experiment, test to the “max” and make them your own. Years ago, I was asked to be a glaze doctor at the National Council on Education for the Ceramic Arts (NCECA) in Las Vegas. I agreed, but told them to label me a glaze deviate instead of a glaze doctor.

Don't be afraid to experiment. Don't be afraid to sacrifice a few pieces on the way to discovering something more exciting.



**Redhot Chilli Pepper Diner, by Jerry Berta. Glazed with red underglazes.**