

Scratching the Surface

A Guide to Sgraffito

by Wayne Bates

The word sgraffito is derived from the Italian word *graf-fito*, a drawing or inscription made on a wall or other surface (*graf-fito* also gave us the word *graffiti*). *Graffito* is past participial of *sgraf-fire*, which means “to scratch.” So the word sgraffito basically means to scratch and create a graphic or an image. In ceramics, sgraffito is a technique of ornamentation in which a surface layer is incised to reveal a ground of contrasting color.

I use sgraffito to get a clean line without masking or rulers, and I do more cutting than scraping. I use a handmade tool that is thin and cuts smoothly. I cut when the piece is stiff leather hard, which makes straight lines possible. If the piece is bone dry, the cut will be jagged and brittle. If the piece is too soft, the tool raises the edge of the cut and makes a higher ragged edge.

If your clay has grog in it, or anything coarser than fine sand, you won't get a smooth cut. I use a rubber-tipped air tool and a soft cosmetic brush to blow or brush off the cuttings. The cut pieces are still



Plates, 10 inches square, sgraffito decoration with clear glaze fired to cone 5.

moist enough to stick if you touch them to the surface, so they should be removed frequently. You can use a thin coat of wax resist to protect light-colored areas from dark cuttings. The wax resist will burn off in the bisque.

Ball clays are used for engobes because they are the most plastic clays and shrink the most allowing more room in the recipe for non-plastic color, frit, modifiers and fillers. Frit is used to bind the coating to the surface and to increase the interface with the pot and the glaze.



I use an automotive-detail-type spray gun to apply engobes and glazes. It has a smaller fan size than the full-size gun, has good volume and is much faster than an airbrush. It's a high volume/low pressure (HVLP) gun and it produces less overspray. I use a large HVLP spray gun for the cover glazes because of its high volume.

CAUTION

Overspray is hazardous. The engobe spray contains silica, which can be harmful if inhaled. Wear a mask, and make sure your booth has an exhaust system.

Wollastonite is used to add calcium so the chrome-tin colors will work, and flint is used as a filler and stabilizer for colors that flux the mix. I mix the engobes thoroughly and screen them through an 80-mesh sieve. Most of my colors come from commercial glaze stains although not all commercial stains will work, but if you think of engobes as being closer to glazes than slips, additives can help produce the right colors. Changes in the frit affects how fluid an engobe is and how it works with the glaze. It can also produce a vitreous, glazelike surface. Changes in the amount of ball clay will make the engobe more or less plastic and change whether it goes on very wet pieces or bone-dry pieces.

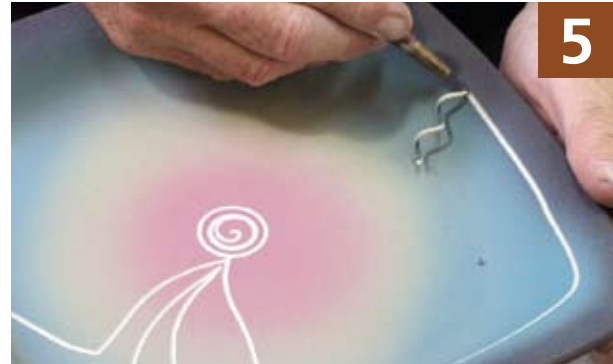
I use a matt and a shiny glaze to cover the engobes on the face of the pieces and these two glazes are what I call "color friendly." To get as many colors as possible, they have to work with the chrome-tin colors, i.e., the

reds, pinks and purples. The molecular recipe has to have three times more calcium than boron for these to work. They have that ratio and will produce the right color with all my engobes. I do use barium for what it does for the colors and for the matt. The potential problem with it has to do with the heavy metals and the possibility of leaching. From what I can find out, if a glaze has less than 15% barium in the percentage composition, it will not promote leaching. From the tests I have done, the glazes that I now use do not promote leaching when used over the engobes. I do use a liner glaze for liquid containers and I don't use the solid color glazes on eating surfaces.

I spray very wet, as if I'm pouring on a small stream of the glaze or engobe on the piece. The engobe sets quickly because the leather-hard piece can absorb some water, but too much engobe and the piece can collapse. If the engobe is too thick, it



4
Place the platter on a foam rubber chuck on the wheel and create the center spiral as the wheel turns.



5
Move the platter to a banding wheel and work freehand.



6
Scrape off large areas last using the flat side of a rib.



7
Cross-hatching is done with a serrated tool.

makes the color and the glaze crawl. Set the fan for a tall oval and overlap the spray by 50% with the piece on a banding wheel turning smoothly through the spray. Practice spraying with paper plates so you can cover the plate smoothly with no bare spots or dusty areas.

The four colors of this color set are Black, French Green, Chartreuse and Crimson and are applied from dark to light (figures 1–2). The spray adds water to the piece and it must dry to the leather hard state before it can be carved. When dry enough, store the pieces on cloth on top of plastic,

and and place cloth over them to prevent condensation from the plastic marring the color (figure 3).

First I create the center spiral and circle using a foam rubber chuck on the wheel (figure 4). All the other lines are done freehand on a banding wheel (figure 5).

The scraping of the larger white spaces is done last, when the piece is even harder. I try to take off only the layer of color (figure 6). I use the the tool tip to make a sort of ditch that you can scrape to or from to make the larger white areas. I use the flat side of a rib to make the larger cuts.

There will be some edges that can be felt, and glazes will break away from these edges, but the glaze will fill in to make it smoother than when cut. Small nicks and cuts can be patched, but the spray overlaps are very hard to color match, so it is best to avoid mistakes! When almost bone dry, use 0000-grade steel wool to lightly smooth some of the cuts and to remove small bits of color.

Cross-hatching is another way of exposing the white of the porcelain and is done with a serrated-edge tool (figure 7). I add black dots of engobe using a squeeze bottle. When all the carving is done, the piece is air-dried then bisque fired, then a clear satin matt or a shiny glaze is sprayed on the front and solid color glazes on the back.

Tools

My sgraffito tool tips are made from the main spring of a pocket watch. The spring metal is thin and strong, doesn't have to be sharpened and keeps the same feel as it wears away. To make the tip, cut a piece of spring, heat it with a small torch and bend it to the shape you want. A small rounded point is used for the line cutting tips, and a broader rounder tip for large cuts. Glue the tip with Elmers glue into the brass ferrel of the trimming tool and allow it to harden. Lightly heating the ferrel softens the glue and the ferrel can be removed and another tip glued into the tool. For ribs, cut them with tin snips from sheets of metal and flatten the edges, making two square edges for scraping (do not sharpen the edges). You can also cut serrated-edge ribs with the snips.



Assorted tools used in sgraffito.

Detail of trimming tool with ferrel removed and watch-spring cutter formed to desired contour.



Recipes

Sgraffito techniques can be a lot of fun, especially with a large color palette of engobes. Most of my colors come from commercial glaze stains. Frits, fillers and retardants are added, depending on the colorant used. The following engobes are mixed with Mason stains.

Engobes

UBL-45 Black

C&C Clay*	50 %
Ferro Frit 3195	20
Black #6600	30
	<u>100 %</u>

UR-31 Crimson

C&C Clay	50 %
Ferro Frit 3134	20
Wollastonite	10
Crimson #6006	20
	<u>100 %</u>

UG-35 French Green

C&C Clay	50 %
Ferro Frit 3134	15
Wollastonite	10
French Green #621	25
	<u>100 %</u>

UG-41 Chartreuse

C&C Clay	50 %
Ferro Frit 3134	20
Chartreuse #6236	30
	<u>100 %</u>

UBL-41 Light Blue Black

C&C Clay*	60 %
Nepheline Syenite	10
Wollastonite	10
Flint	10
Black #6616	10
	<u>100 %</u>

UG -69 Turquoise Green

C&C Clay	50 %
Wollastonite	10
Ferro Frit 3134	20
Turquoise #6393	20
	<u>100 %</u>

UBR-17 Seal Brown

C&C Clay	40 %
Nepheline Syenite	20
Wollastonite	10
Seal Brown #6153	30
	<u>100 %</u>

UB-18 Teal Blue

C&C Clay	60 %
Ferro Frit 3134	30
Teal #6305	10
	<u>100 %</u>

UR-28 Dot Red

C&C Clay	50 %
Wollastonite	20
Ferro Frit 3134	10
Crimson #6006	20
	<u>100 %</u>

UBL-46 Blue Black

C&C Clay	50 %
Nepheline Syenite	10
Silica	10
Black #6616	30
	<u>100 %</u>

UB 22-Turquoise Blue

C&C Clay	50 %
Ferro Frit 3134	10
Wollastonite	10
Zircopax	10
Turquoise #6390	20
	<u>100 %</u>

UP-49 Hot Pink

C&C Clay	40 %
Ferro Frit 3134	40
Pink #6020	20
	<u>100 %</u>

UP-34 Coral

C&C Clay	50 %
Ferro Frit 3134	10
Wollastonite	10
Coral #6090	30
	<u>100 %</u>

UGR-10 Silver Gray

C&C Clay	60 %
Ferro Frit 3134	10
Silica	10
Silver #6530	20
	<u>100 %</u>

UPR-32 Deep Orchid

C&C Clay	50 %
Nepheline Syenite	10
Deep Orchid #6303	30
Wollastonite	10
	<u>100 %</u>

UY-38 Hot Yellow

C&C Clay	50 %
Nepheline Syenite	10
Ferro Frit 3134	10
Wollastonite	10
Yellow #6481	20
	<u>100 %</u>

UW-1 White

C&C Clay	30 %
Nepheline Syenite	20
Ferro Frit 3134	10
Wollastonite	10
White #6700	30
	<u>100 %</u>

UB-7 Peacock Blue

C&C Clay	40 %
Nepheline Syenite	10
Peacock Blue #6396	40
Wollastonite	10
	<u>100 %</u>

UPR-31 Pansy Purple

C&C Clay	50 %
Nepheline Syenite	10
Wollastonite	13
Pansy Purple #6385	27
	<u>100 %</u>

*C&C clay is a ball clay. If not available, another ball clay may be used, but the results may vary. Although formulated for cone 6, many of these will work at higher and lower temperatures.

Recipes

Glazes

The following glaze recipes can be used over the engobes, but they can also be tinted with stains.

R-1030 Satin Matt*

Cone 5

Barium Carbonate	11 %
Wollastonite	15
Ferro Frit 3134.	19
Nepheline Syenite	33
EPK Kaolin	16
Silica	6
	<hr/>
	100 %

Similar to R-1015 but lower temperature. Will go shiny if fired higher. Top of my kiln.

R-1012 Satin Matt*

Cone 5

Barium Carbonate	11 %
Whiting	12
Ferro Frit 3134.	17
Nepheline Syenite	44
EPK Kaolin.	7
Silica	9
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	100 %

Similar to R-1015 but lower temperature. Middle of my kiln.

R-1015 Satin Matt*

Cone 6

Barium Carbonate	16 %
Wollastonite	15
Ferro Frit 3134.	13
Nepheline Syenite	33
EPK Kaolin.	14
Silica	9
	<hr/>
	100 %

G-19 Shiny Clear

Cone 6

Wollastonite	30 %
Ferro Frit 3195.	30
EPK Kaolin.	20
Silica	20
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	100 %

Color friendly base, will produce shiny versions of most of the Mason stain colors. Can be used as a liner glaze, unlikely to produce leaching.

Frosty Matt

Cone 6

Barium Carbonate	22%
Lithium Carbonate.	5
Nepheline Syenite	60
EPK Kaolin.	8
Silica	5
	<hr/>
	100 %

High alkaline, distinct color characteristics, crystalline sugar like surface, turns copper turquoise, brightens most colors.

*Contains barium. Can produce leaching when used with heavy metals. No claims made for success or safety.