NYSCC @ Alfred University's

Raw Materials Cookbook 2008

"Unbelievably silicious recipes... in half the time!"
-2008 Raw Mats Class-

Name: Allison Craver & Caitlin O'Brien
Purpose of Research: A colored casting body
Firing Range: Cone 3

Recipe(s):

Revised Wally's Wonderslip	
GoldArt	21
Tennessee #10	10
EPK	12
Custer Feldspar	24
Frit 3124	8
Flint	25
Total	100%
Darvan #7	1.016%
Water	?

Revised Wally's Wonderslip (adjusted for colorants)	
GoldArt	18.9
Tennessee #10	9.0
EPK	10.8
Custer Feldspar	21.6
Frit 3124	7.2
Flint	22.5
Colorant	10
Total	100%
Darvan #7	1.016%
Water	?

Development:

In order to conserve energy, several professors and practicing artists at Alfred University have started firing at lower temperatures. It will be important to have a full catalog of new recipes that have been tested and proven at these temperatures—which is why we chose to develop a body for Cone 3. The goal of our research was to create a Cone 3 casting body for both functional and sculptural wares. We intended to make a body to add colorants to. Once we had a working recipe, adding colorants would be an easy way to control the color of the body.

We used a revised version of Wally's Wonderslip to encourage the formation of more glass in the body. Our results were difficult to interpret because the kilns under-fired each time. Our first cast samples (using the Revised Wally's Wonderslip for Colorants) felt smooth and chalky and when tapped and emitted a dull tone rather than a high ping usually associated with fired ceramics. Shrinkage and Absorption tests were performed on the set of cast samples. Shrinkage was minimal but the tiles absorbed up to 19%, which could be a result of under-firing but was discouraging nonetheless. A second set of samples were cast, fired, and glazed with several different Cone 3 glazes. The body reacted well to glazing, there was no crazing or shivering but again the kiln did not reach temperature and the glaze was under-fired. Overall the Revised Wally's Wonderslip recipe produced promising results for Cone 3 and with a little more research to confirm these results could be a valuable addition to recipe books.

Revised Wally's Wonderslip (viscosity notes)	
Drops of Darvan #7	Observations
2	Thick Paste
4	Paste
6	Slightly Thinner - still quite thick
8	No noticeable change
10	Still think, but beginning to smooth out
12	Slightly thinner
14	Noticeably thinner
16	No change
18	Consistency of a milkshake
20	--- not tested ---
22	Could be poured, still thick
24	Consistency of cream
26	Noticeably thinner
28	Thin, runs off stirrer
30	Slightly thinner
32	Slightly thinner
34	Beginning to become runny
36	Slightly thinner
38	No change
40	No change
42	No change
44	No change
46	No change
48	Slightly thicker
50	No noticeable change

Revised Wally's Wonderslip (short term gelling and settling notes / 25 minute test)	
Drops of Darvan #7	Observations
34	Thick layer on bottom, but no gelling / no settling
36	Somewhat gelled / no settling
38	No gelling / no settling
40	No gelling / no settling
42	No gelling / no settling
44	No gelling / no settling
46	No gelling / no settling
48	No gelling / no settling
50	No gelling / no settling

Revised Wally's Wonderslip (long term gelling and settling notes / overnight test)	
Drops of Darvan #7	Observations
34	Fully gelled / no settling
36	Fully gelled / no settling
38	Somewhat gelled / no settling
40	Somewhat gelled / no settling
42	Somewhat gelled / no settling
44	Hardly gelled / no settling
46	Hardly gelled / no settling
48	Not gelled / no settling
50	Not gelled / no settling

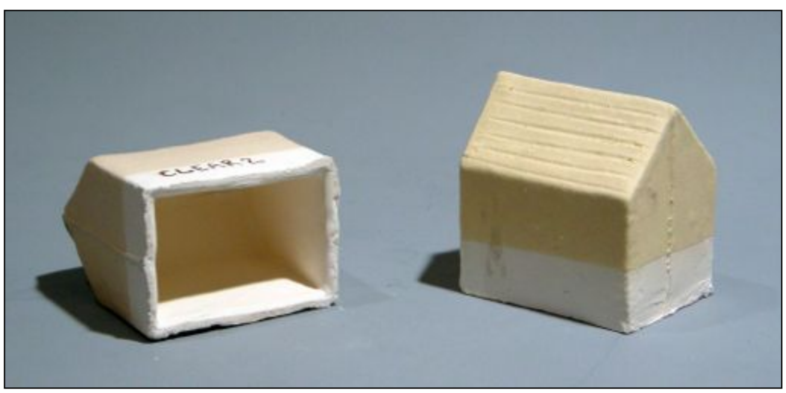
Revised Wally's Wonderslip (casting tests / 25 minutes in a mold)		
Drops of Darvan #7	Amount of Darvan #7	Observations
34	0.86%	gelled before casting time – not good
36	0.91%	OK, maybe too gelled at 25 min..
38	0.96%	good
40	1.016%	good, best?
42	1.07%	good

Revised Wally's Wonderslip (absorption tests / completed on tiles fired to cone 3)		
Drops of Darvan #7	Amount of Darvan #7	Absorption
34	0.86%	18.4%
36	0.91%	18.7%
38	0.96%	17.7%
40	1.016%	19%
42	1.07%	18%

Revised Wally's Wonderslip (shrinkage tests / completed on tiles fired to cone 3)		
Drops of Darvan #7	Amount of Darvan #7	Total Shrinkage
34	0.86%	3%
36	0.91%	3%
38	0.96%	3%
40	1.016%	4%
42	1.07%	6%

Castings done with increasing amounts of Darvan (drops of Darvan from left to right: 34, 36, 38, 40, 42).

Castings done with 34 drops (0.86%) of Darvan on the left and 40 drops (1.016%) on the right. Note that the sample on the left coagulated, which prevented the slip from draining properly during casting. The additional Darvan on the right helped destroy this coagulation, allowing for better drainage.



Castings of a house done using the final recipe (with 1.016% Darvan).

Inside of house object. The smooth surfaces suggest good drainage.

Name:	Sharie Willey and Nicole Truisi
Purpose of Research:	Photoluminescent ceramics
Firing Range:	Up to C. 10 Ox., Red, and microwave
Recipe(s):	Neodymium sulfate Praseodymium sulfate Europium sulfate Terbium sulfate Ytterbium sulfate

Development:

The purpose of this research was to investigate Photoluminescence using ceramic materials fired under a variety of atmospheric firing conditions.

We began the test series using two different substrates: tape-cast alumina and a recently developed porcelain body (body #1 from this year's potluck bodies) which we'll call C&J's Porcelain.

Each of the materials used started off as sulfate powders which were diluted to varying degrees using tap water. These were applied to the substrates in such a way that each one would be mixed with each of the others, as well as a pure sample of each by itself (see graph on following page).

Three of the alumina substrates were fired in the kiln room in Harder under both reduction and oxidation conditions. We then fired 2 of each substrate in a microwave kiln at the Ceramics Corridor, with Gary DelRegno firing the kiln as we audited the process.

The alumina tiles were very fragile and broke apart not only during firing (microwave), but also as it was cooled. This type of application requires some degree of porosity of the substrate, which is not present with this type of tile. As a result, a visible amount of powdered element substance resulted from lack of absorption into the tile after the firing.

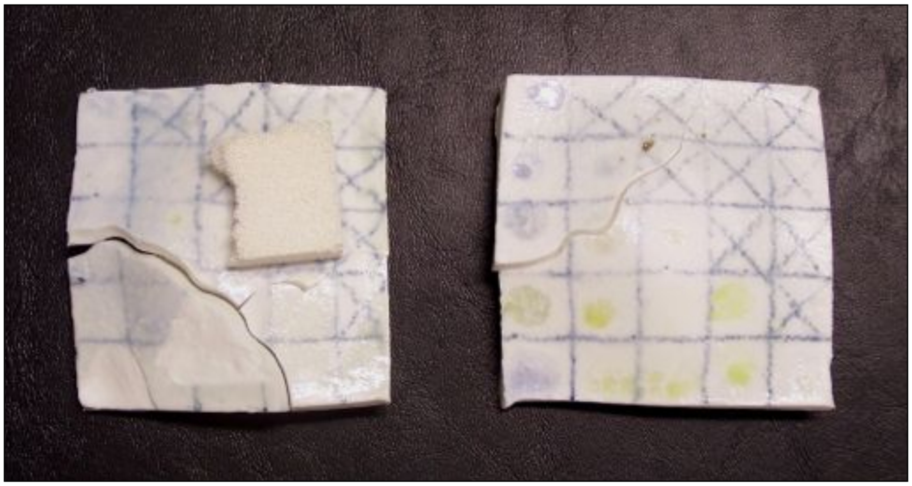
The C&J Porcelain tiles were first fired in Harder Hall to get them to a vitreous state for better application. One tile was clear glazed and fired again, and the other was clear glazed and unfired. The application of the elements onto the glaze-fired tile resulted in the substance sitting on the top of the tile and not spreading out. The raw-glazed tile caused the substance to soak into the glaze, giving it a more spread-out effect. These tiles held up well under the microwave firing, with a small amount of slumping, which is to be expected given the rate of climb and temperature reached (refer to graph).

Nd	Nd				
Tb	Tb+Nd	Tb			
Eu	Eu+Nd	Eu+Tb	Eu		
Pr	Pr+Nd	Pr+Tb	Pr+Eu	Pr	
Yt	Yt+Nd	Yt+Tb	Yt+Eu	Yt+Pr	Yt
	Nd	Tb	Eu	Pr	Yt

Legend for all test tiles

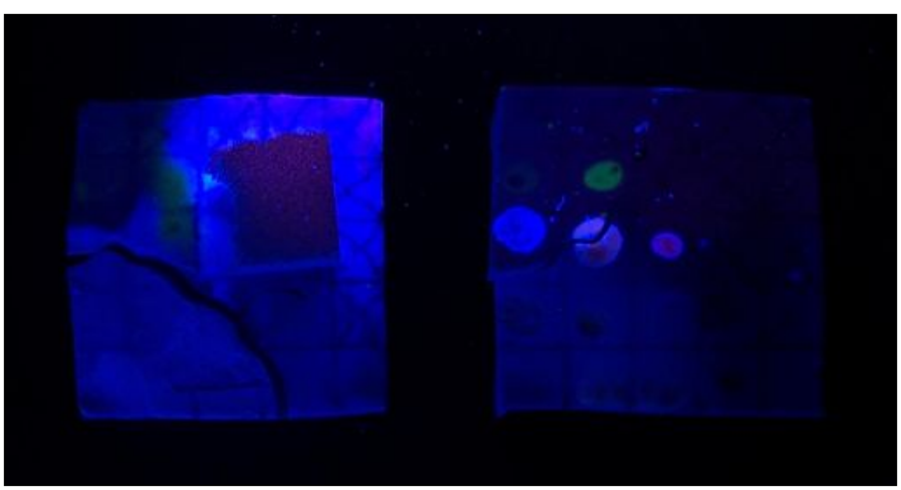
In the above table, the following abbreviations are used:

Nd = Neodymium
Tb = Terbium
Eu = Europium
Pr = Praseodymium
Yt = Ytterbium

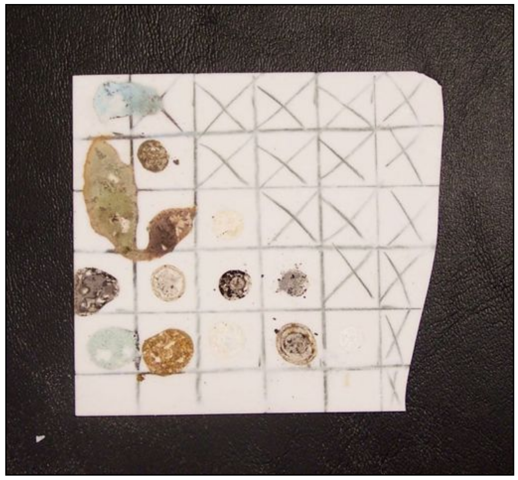


C&J’s porcelain
Microwave firing

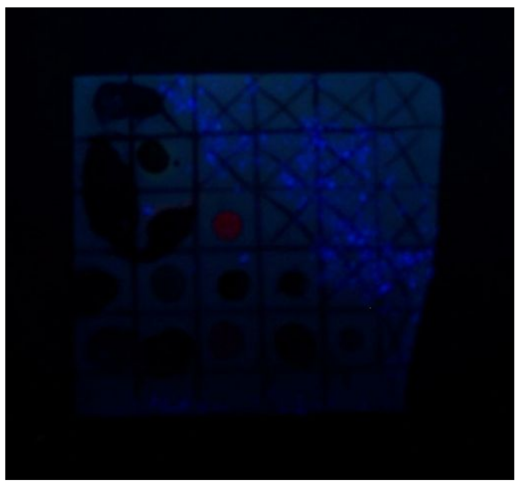
Short-wave UV



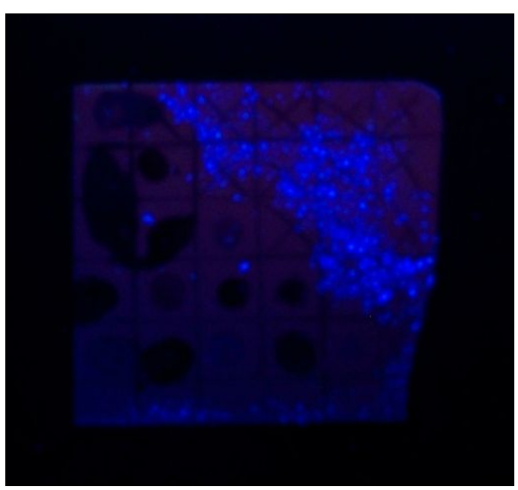
Long-wave UV



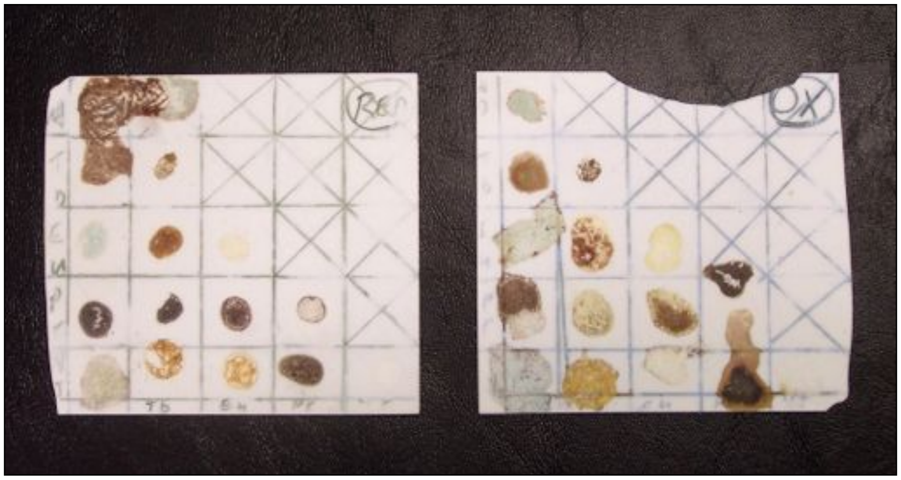
Alumina substrate
Unknown firing (not microwave)



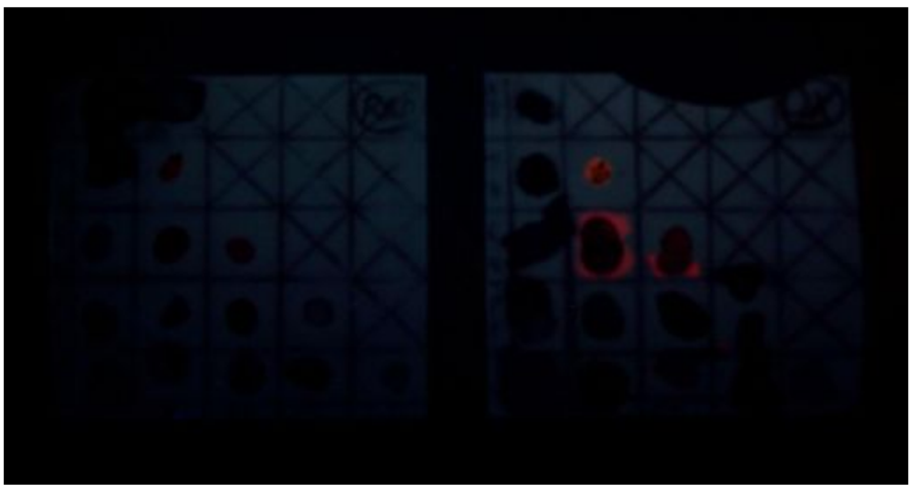
Short-wave UV



Long-wave UV



Alumina substrate
Reduction on the left; Oxidation on the right.

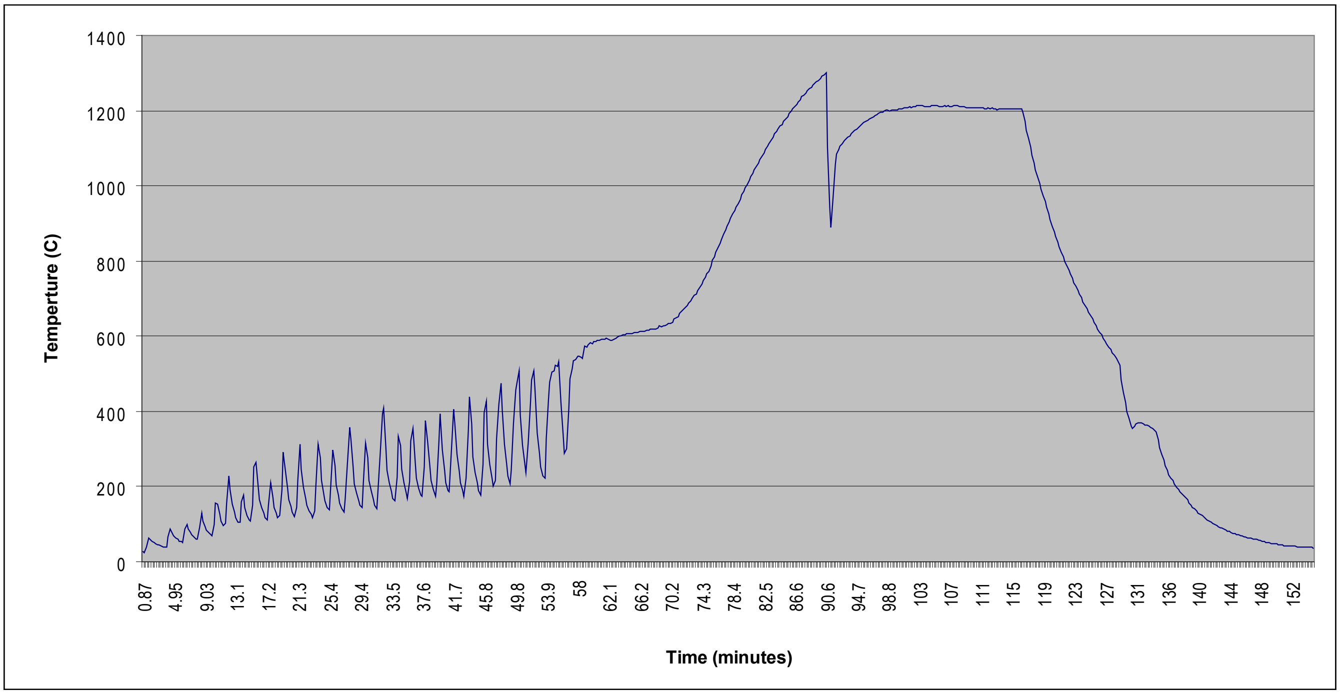


Short-wave UV

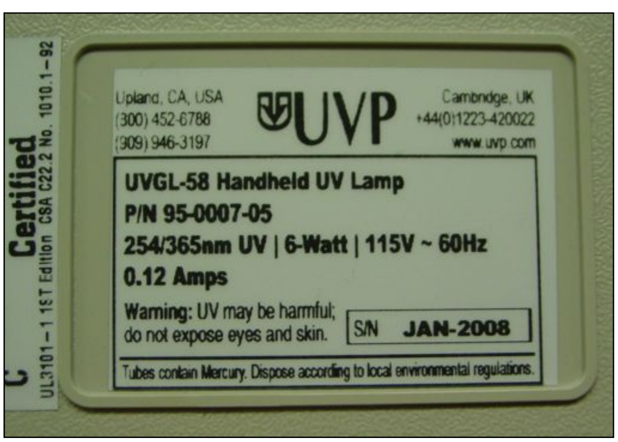
Regarding the test tiles under UV illumination:

Both sets of tiles showed varying degrees of photoluminescence (refer to photo documentation). These were viewed under Short Wave UV (254nm) and Long Wave UV (356nm).

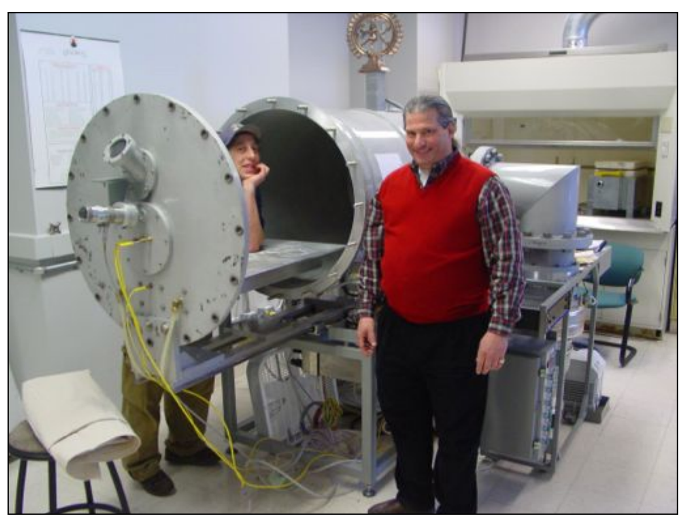
The C&J Porcelain tiles were again found to be more practical. In this case because the alumina tiles seemed to absorb the UV light, affecting the visual results to a small degree. This, along with the porosity issue caused the C&J Porcelain to achieve much brighter results. We also found that illuminating the substrates while placed on a matte black surface created a more accurate result.



The information in the chart above was collected from equipment which monitored the microwave during the firing of our samples. Total firing time was 154 minutes. Top recorded temperature was 1301°C (2373°F). However, due to discrepancies in thermal couple equipment, we believe the top temperature was actually closer to 1538°C (2800°F).



Nameplate from the UV light used for documentation (both short and long-wave UV).



Gary and Sharie (Crash), chillin by the microwave.

Pre fired tests loaded in sagger. Colors are due to food colorants added to each sulfate for easier visualization of the application process.

Fiber blanket was used to help retain heat and reach temperature faster.

Crucible cooling after firing (note white-hot crack).

Samples after firing in the sagger.

CONCLUSION:

The tests were a huge success and will be ongoing in various forms. We will continue to use the C&J Porcelain in future tests, as well as different methods as it applies to application, firing, dilution and substrate material. Concerning the tiles, we will attempt to achieve much thinner tiles for future exploration with translucency of the porcelain.

Name: James Pastore
Purpose of Research: Compatibility between stoneware throwing and casting bodies
Firing Range: Cone 10 Ox

Recipe(s): Various (see below)...

Development:

With throwing at the heart of my studio practice I decided to develop a casting body that would complement pots from the wheel. The goal of these tests was to find a compatible casting body that would shrink at the same rate as #570 and not have problems with cracking and shrinking. This would ensure much cleaner, professional attachments of handles, springs, spouts, etc…

I used Linda's 570 stoneware in its original state and then created three revisions. The casting revisions progressively decreased the surface area of the #570 body in order to shorter casting times. This was done by adding increasing amounts of Velvacast in each recipe. Also, the amount of Custer was increased to help melt the velvacast because it is cleaner and has fewer alkalis. The amount of grog remained the same in all the recipes, so settling changed from test to test.

Original #570	
Hawthorn bond 35	24.85
EPK	16.56
Om-4	12.42
GoldArt	24.85
Custer Feldspar	8.28
Fine Grog	13.04
Total	100%
Darvan #7	0.762%
Water	?
Surface Area	19.08 m^2/gm

Original #570	
Drops of Darvan #7	Observations
2	very thick / doesn't move
4	same
6	thick slip
8	same
10	same
12	same
14	thinner / thick like custard
16	same
18	same
20	a lot thinner / like yogurt
22	thinner
24	thinner
26	thinner / heavy cream
28	same
30	thinner / IDEAL FOR CASTING
32	little thinner
34	MINIMUM VISCOSITY
36	same
38	same

At the ideal consistency (30 drops of Darvan; 0.762%) with 15 minutes of sitting, original #570 almost completely gelled.

#570 Revision 1	
Velvacast	12.22
Hawthorn bond 35	20.25
EPK	13.50
Om-4	10.12
GoldArt	20.25
Custer Feldspar	10.62
Fine Grog	13.04
Total	100%
Darvan #7	0.66%
Water	?
Surface Area	17.03 m^2/gm

#570 Revision 1	
Drops of Darvan #7	Observations
2	thick
4	thick
6	thick
8	thick
10	thick
12	thinner
14	thinner but still doesn't move
16	thinner / thick pudding
18	same
20	a lot thinner / still on the thick side but pourable
22	thinner
24	thinner
26	IDEAL FOR CASTING
28	thinner
30	MINIMUM VISCOSITY
32	same
34	same
36	same
38	same
40	same

At the ideal consistency (26 drops of Darvan; 0.66%) with 15 minutes of sitting, #570 Revision 1 only partially gelled! No significant settling.

#570 Revision 2	
Velvacast	24.65
Hawthorn bond 35	15.57
EPK	10.38
Om-4	7.78
GoldArt	15.57
Custer Feldspar	13.01
Fine Grog	13.04
Total	100%
Darvan #7	0.66%
Water	?
Surface Area	14.95 m^2/gm

#570 Revision 2	
Observations	Same results as revision #1. 26 drops of darvan is ideal for casting and 30 is minimum. The only difference was more settling.

#570 Revision 3	
Velvacast	37.15
Hawthorn bond 35	10.86
EPK	7.24
Om-4	5.43
GoldArt	10.86
Custer Feldspar	15.42
Fine Grog	13.04
Total	100%
Darvan #7	0.66%
Water	?
Surface Area	12.85 m^2/gm

#570 Revision 3	
Observations	Again, same results as revision #1. 26 drops of darvan is ideal for casting and 30 is minimum. However, this showed even more settling than the previous two tests.

For Revision 3 I also did a Thixotropy test by timing how long 250 ml. of the casting slip took to pour out of 6 mm hole. Time differences are due to thixotropy.

Viscosity 1: 22 sec.
Viscosity 2: (5 minutes of settling) 29 sec.

Thixotropy: 24

The above references the Thixotropy test on pg. 297 of *The Ceramic Process*

The Ceramic Process, Anton Reijnders, A&C Black Publishers Limited, 2005

Series of tests. All bowls were thrown using #570 boxed clay. Castings inside the bowls from left to right: Original #570, #570 Revision 1, #570 Revision 2, #570 Revision 3.

Original #570

Detail of Original #570

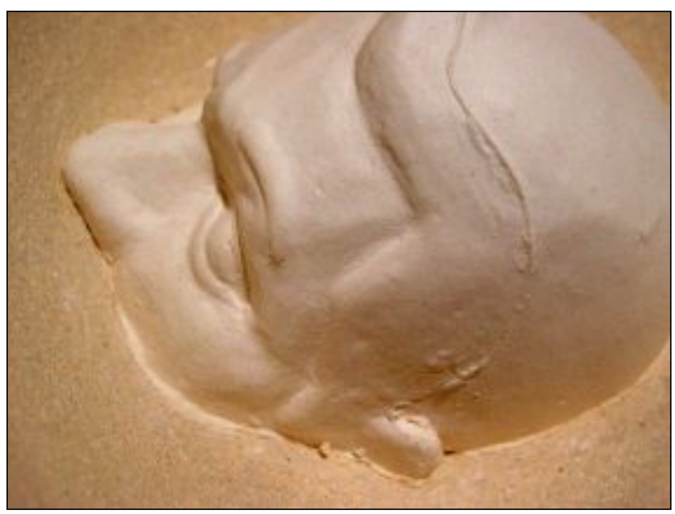
#570 Revision 1

Detail #570 Revision 1

#570 Revision 2

Detail #570 Revision 2

#570 Revision 3



Detail #570 Revision 3

Note the difference in color between Original #570 on the left and #570 Revision 3 on the right.

Homemade apparatus for recording the viscosity of slip.

Name:	T.J. & Chen Fei
Purpose of Research:	Slip casting Body
Firing Range:	Cone 04

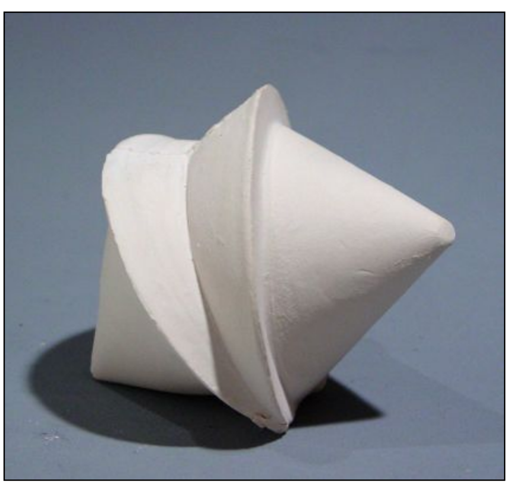
Recipe(s):	6 Tile	13.1
	Tennessee 10	13.1
	EPK	26.2
	Frit 3124	33.9
	Flint	4.1
	Molochite 200 mesh	11.3
	Add:	
	Darvan 7	1.7%
	Water	43%

Development:

Our Goal was to develop a slip casting body that was compatible to our earlier developed potluck throwing and hand building body at cone 04.

The results were excellent. The bodies were definitely compatible. There was no visible sagging or warping and minimal cracking. The cracking that did occur was right on a seem where the slip casting body met the hand built body, however the cracking could have been avoided with better welded seems. The only negative to the body was a slow release time from the mold. On average, the object took an hour to release.

In future tests we would like to test adding fibers to the casting body. It was not applicable to try doing so at this point because of our limited experience casting. We found that our time was better spent exploring the basics of casting before trying anything too foreign.



Cast object

Detail of Cast object

Cast object with hand built attachment

Alternate view of cast object with hand built attachment

Cast object with hand built attachment (second variation)

Alternate view of cast object with hand built attachment (second variation)

Detail view of cast object with hand built attachment (second variation)

Name: Kaye Waltman
Purpose of Research: Crawling layered glaze for bisque application
Firing Range: Cone 6 Ox and Re

Recipe(s):

Preferred Final Recipes (a complete list of recipes tested is found on the next page):

Lana's Ball Crawl (LBC)		Wirt Shino	
Neph. Sy.	60%	Neph. Sy.	45
Magnesium Carb.	22	Kona F-4	10.8
OM-4	18	EPK	20
		OM-4	15.2
		Soda Ash	19
		Redart	66

Clay bodies used:

#444 Stoneware		Group 1 Porcelain (from this cookbook)		Val Cushing's "Easy" Stoneware	
HB 35	38.1%	Ultrafine H	43.6%		
Goldart	23.81	Tennessee #10	9.7	Goldart	30%
OM-4	23.81	G-200	32.8	Hawthorn	30
G-200	9.52	Flint	10.9	Lizella	40
Sand	4.76	Veegum	3.0		

Development:

I wanted to develop a crawling slip that could be used in combination with glazes to alter their texture and color. I started by testing 15 shino glazes that came from reputable sources. I chose shinos because they tend to crawl when applied too thick due to high clay content and are somewhere between a glaze and a slip in formula. I tested the glazes in Oxidation and Reduction at ^6. Also, I tested each glaze over three different bodies: Val Cushing's Easy stoneware, #444, and group #1's porcelain from 2008. Two glazes had the results I was looking for (Lana's Ball Crawl and Korean 22 shino), while others were glassy with no crawling. I then tested the crawling glazes and the glassy glazes together for thickness and layering pattern (over-under, under-over) and found three combinations that yielded my desired results. These glazes were then tested a retested and fired vertically and on cups to determine the possibilities of actual use on pots.

My final product is a dark shinny glaze that has dramatic crawling when thickly applied. The edges of LBC curl up over the Wirt and melt in, creating white highlights and leaving bare clay in between beads of glaze. I would like to do color tests using LBC and then test those with layering glazes to alter colors and breaking patterns of color in the way that the white and brown function in these test tiles.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Neph Sy	45	39				40		60		31.5	54.5	45	40	88	40
Kona F-4	10.8	9			9.4		15			17		10.8	10		
Spodumene	15.2					9					22.8		10		17.3
Lithium Carb.					6.5				4	5					
Soda Ash	4	16				12				7	2.9	19	5		4
3134			40	33											
Gerstley Borate					18.7		35				4.9				
Custer Feldspar						12			60						20
Barium Carb.							5								
Dolomite			5												
Whiting				3		1	10		10						
Zinc Ox.				10											
Magnesium Carb.								22	26						
Flint				8	9.4		10		10						
Tin Oxide							13		7						
Ultrox															
Om-4	15	13				15		18		15	14.9	15.2	10	3	14.7
EPK	10	17				8				24.5		20	10	9	4
Alberta Clay					56										
Redart		6	30	53		3						66			
Red Iron Oxide			1				2								
Total	100	100	91	122	100	100	90	100	117	100	100	176	85	100	100

In the above table, the following abbreviations are used:

1 = Gustin Crawl Shino
2 = Malcolm Davis Shino
3 = Falls Creek Shino Ababi #6
4 = Falls Creek Shino Ababi #2
5 = Falls Creek Shino
6 = Orange Carbon Trap Shino
7 = Adam's Shino
8 = Lana's Ball Crawl
9 = Korean 22
10 = Revised K Shino
11 = Clausen Shino
12 = Wirt
13 = Sam's
14 = Traditional
15 = Carbon Trap

Reduction	Group #1 Porcelain	#444 Stoneware	VC Easy Stoneware
Oxidation	Group #1 Porcelain	#444 Stoneware	VC Easy Stoneware

All tiles 3 coats brushed

Orange Carbon Trap

Clousen shino

Traditional shino

Sam's shino

Gustin Crawl shino

Revised Korean shino

Carbon Trap shino

Malcolm's shino

Falls Creek shino

Adam's shino

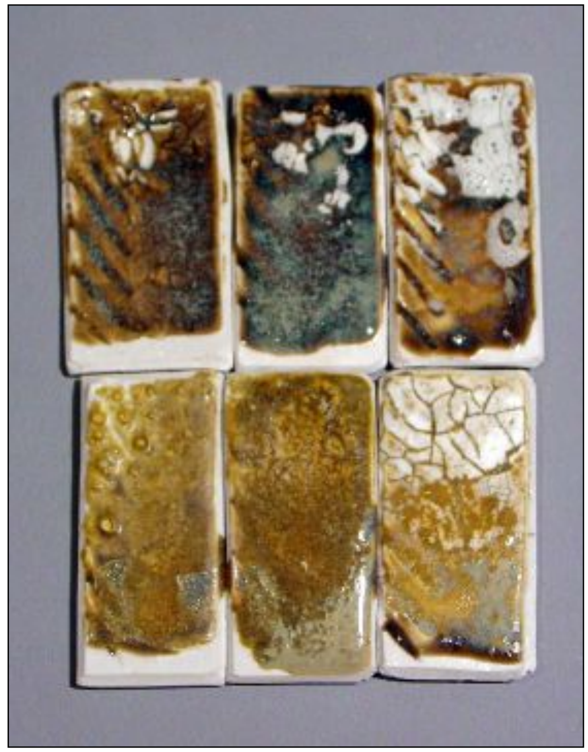
Falls Creek Ababi 2

Falls Creek Ababi 6

Wirt shino

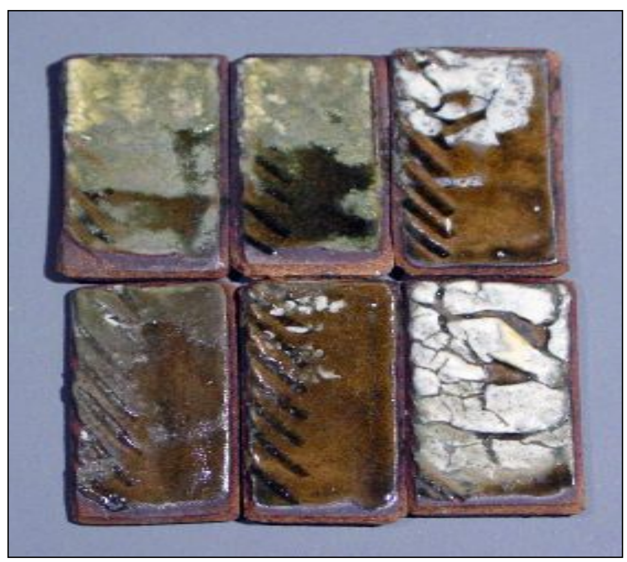
Lana’s Ball Crawl

Korean 22



Top left to right: Lana's Ball Crawl with Falls Creek 6 over top thin and thick; Falls Creek Ababi 6 with Lana's Ball Crawl over top.
Bottom left to right: Korean 22 with Falls Creek 6 over top thin and thick; Falls Creek Ababi 6 with Lana's Ball Crawl over top.

Top left to right: Lana's Ball Crawl with Falls Creek shino over top thin and thick; Falls Creek shino with Lana's Ball Crawl over top.
Bottom left to right: Korean 22 with Falls Creek shino over top thin and thick; Falls Creek shino with Korean 22 over top.



Top left to right: Lana's ball crawl with Adam's shino over top thin and thick; Adam's shino with Lana's ball crawl over top.
Bottom left to right: Korean 22 with Adam's shino over top thin and thick; Adam's shino with Korean 22 over top.

Top left to right: Lana's Ball Crawl with Wirt shino over top thin and thick; Wirt shino with Lana's Ball Crawl over top.
Bottom left to right: Korean 22 with Wirt shino over top thin and thick; Wirt shino with Korean 22 over top.

Left to right: Korean 22 with Falls Creek shino over top; Lana's Ball Crawl with Wirt shino over top; Korean 22 with Wirt shino over top.

Lana's Ball Crawl with Wirt shino overtop.

Detail of Lana's Ball Crawl with Wirt shino overtop.

Korean 22 with Wirt shino overtop.

Detail of Korean 22 with Wirt shino overtop.

Falls Creek shino with Korean 22 overtop.

Detail of Falls Creek shino
with Korean 22 overtop.

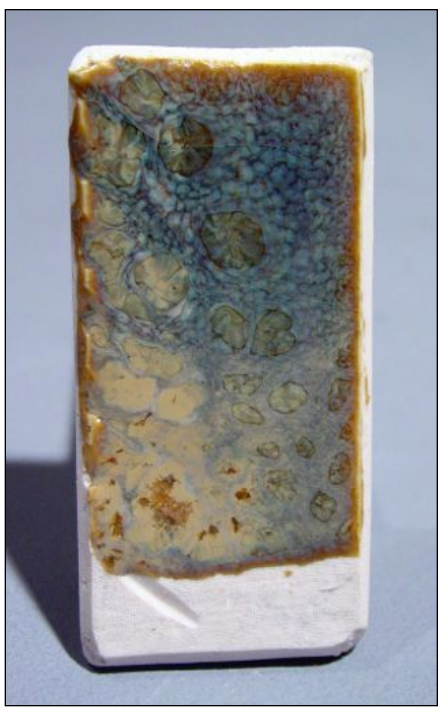
Korean 22 on the outside and Adam's shino
on the inside - VC easy stoneware body.

Detail of Korean 22 on VC easy stoneware
body.

Lana's Ball crawl

Korean 22

Revised Korean



Falls Creek Ababi 2. The original recipe called for an opacifier but it wasn't used in this test.

Falls Creek Ababi 6. The original recipe called for opacifier but it wasn't used in this test.

Name: Cassandra J. Kellam
Purpose of Research: Colored throwing bodies
Firing Range: Cone 6

Recipe(s):

	#444 Original	#444 Variation 1	#444 Variation 2
Hawthorn 35	38.10	38.10%	38.1
Gold Art	23.81	23.81%	23.81
OM-4	23.81	23.81%	23.81
G-200	9.52	14.28%	
Neph . Sy.			9.52
Sand	4.76		4.76
	100%	100%	100%

	#570 Original	#570 Variation 1	#570 Variation 2
Hawthorn 35	24.85	24.85	24.85
Gold Art	24.85	24.85	24.85
OM-4	12.42	12.42	12.42
EPK	16.56	16.56	16.56
Custer	8.28		2.76
Neph . Sy.		10.28	10.28
Flint		2.76	
Fine Grog	13.04	8.28	8.28
	100%	100%	100%

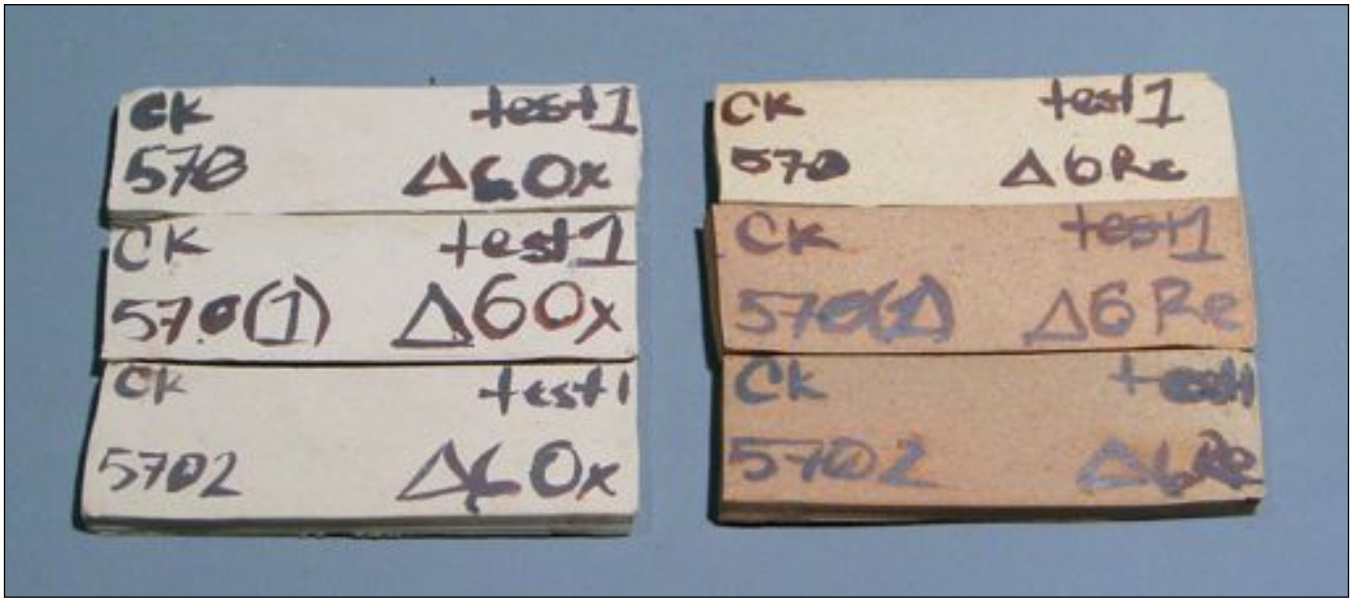
For the colored clays, I added 2-10% of the colorants Red Iron Oxide, Yellow Ochre, and Pearl ash (Potassium Carbonate).

Development:

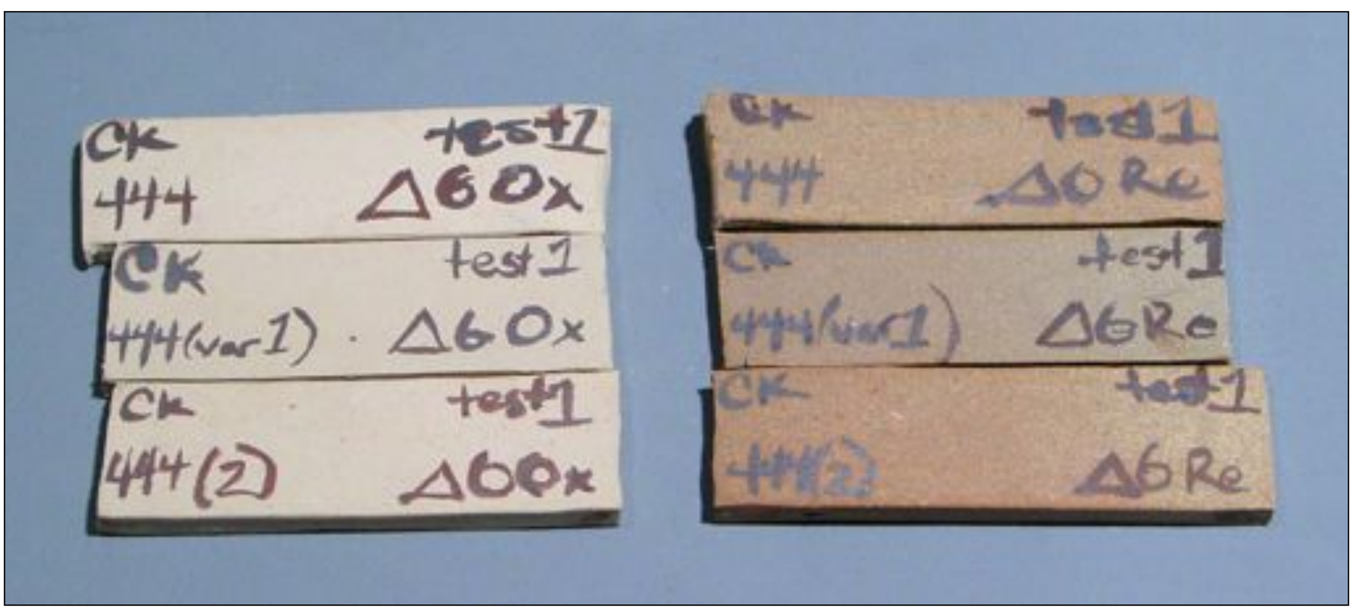
The goal of the research was to acquire a rich color from the clay body when fired to temperature.

First, the cone 10 #570 and #444 clay bodies were both modified with different glass formers. Ultimately, each was assigned two variations. I mixed 400g. 6 different clays (including the original bodies so I would be able to compare them with the new ones) in total and made two tiles for each, one for oxidation and one for reduction. After the firing, I did a porosity test on all of the oxidation tiles in order to figure out which was the densest for the #570 and the #444. Upon finding the densest variation, I proceeded to use it to explore variations of the colorants: Yellow Ochre, Red Iron Oxide, and Pearl Ash (Potassium Carbonate) in 2% increments beginning at 2% and ending at 10% out of a total of 400g. At this point, I made 60 tiles altogether including 3 5-point line blends for each colorants in each of the two modified clay bodies and a tile for each test at oxidation and reduction.

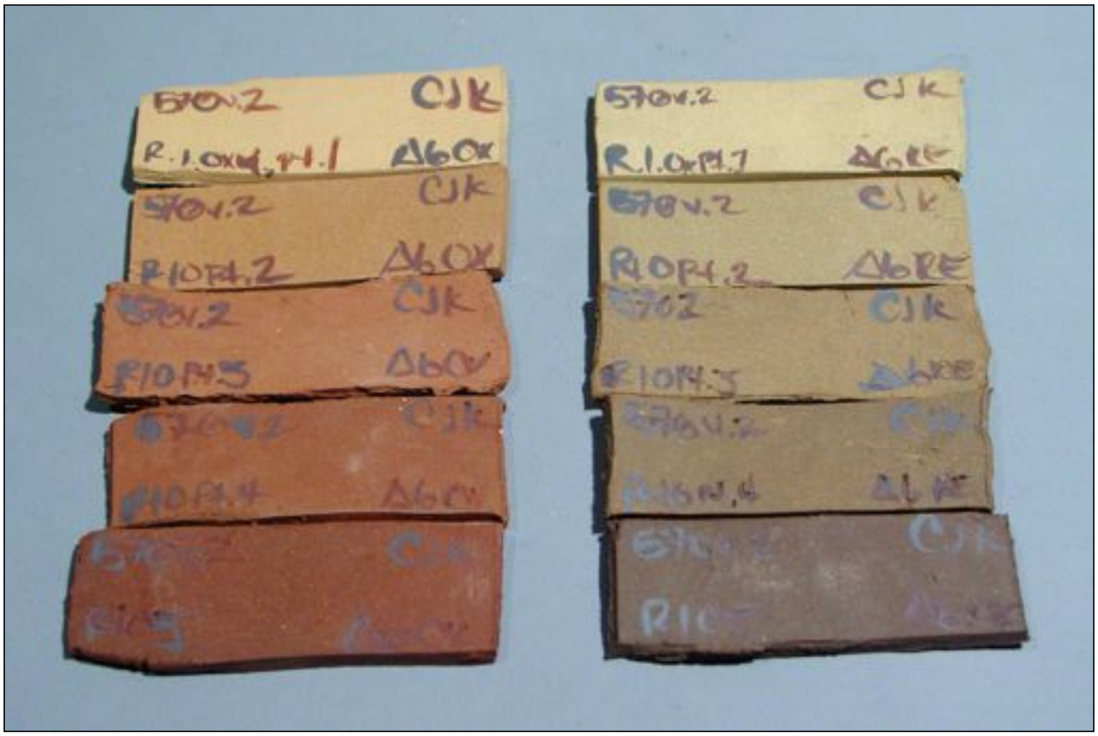
I received the richest results from the #444 modified clay body fired at oxidation. My favorite colors were from the Yellow Ochre line blend, while my least preferred were from the Pearl Ash, which was a complete disappointment.



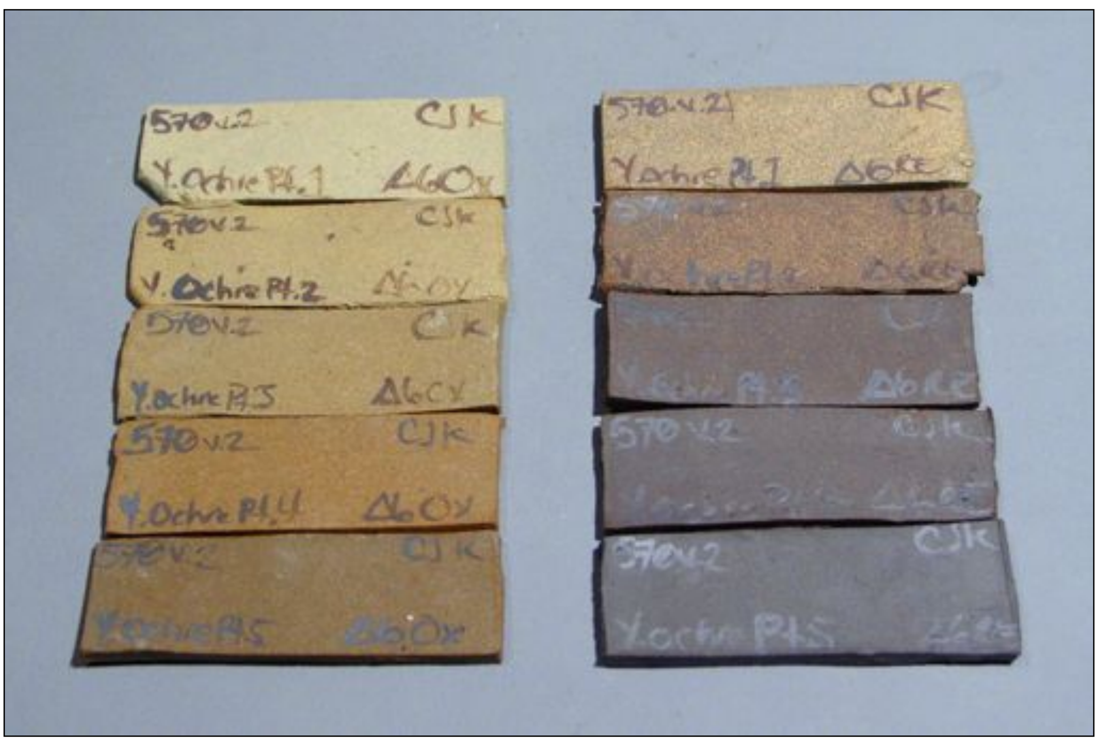
Tests for the #570 body without colorants. Original recipe on top, with Variation 1 and 2 below. Oxidation on the left, reduction on the right.



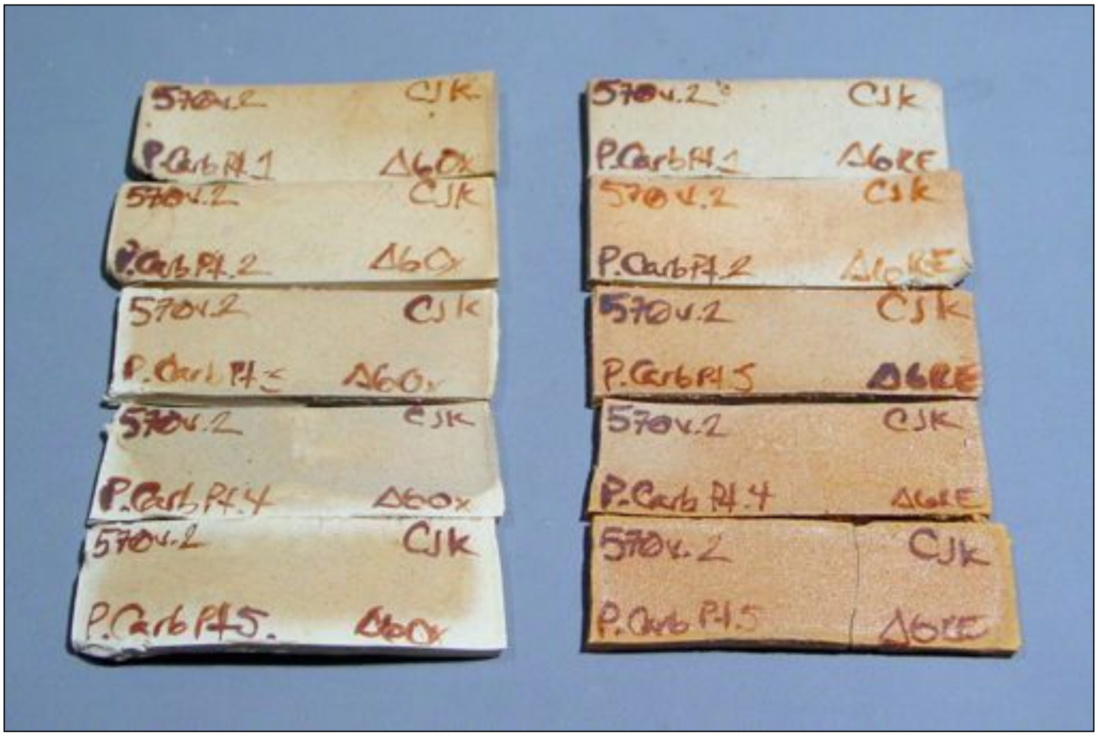
Tests for the #444 body without colorants. Original recipe on top, with Variation 1 and 2 below. Oxidation on the left, reduction on the right.



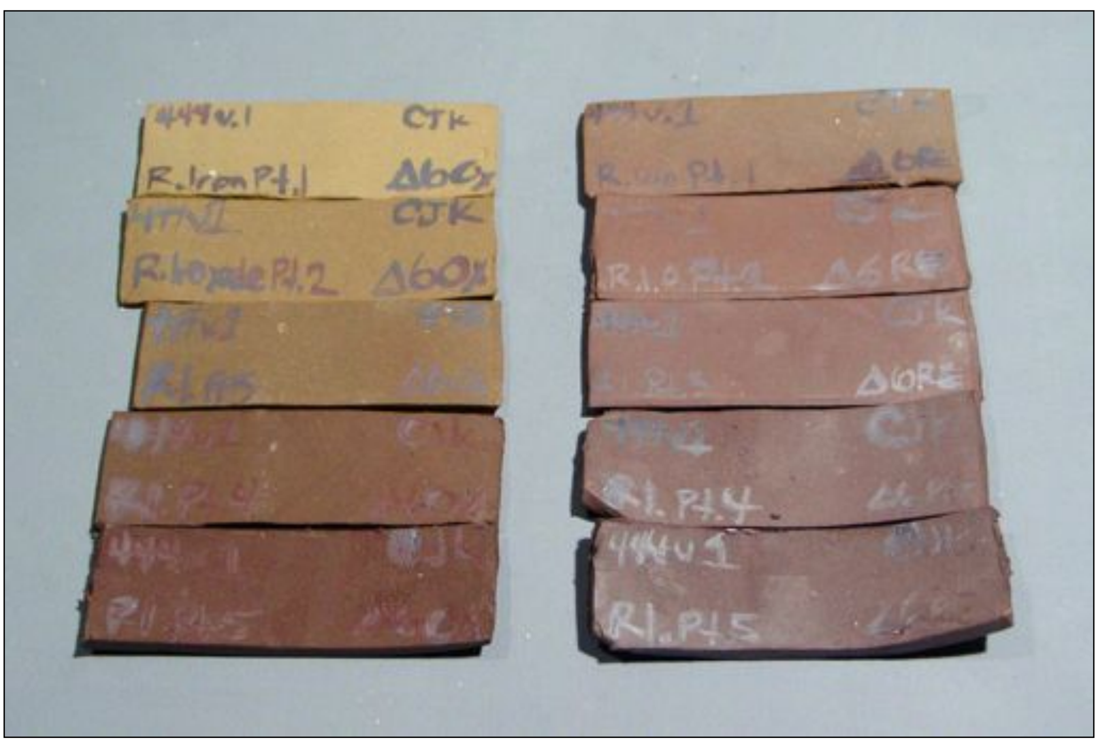
The #570 Variation 2 body with Red Iron Oxide additions in 2% increments from top to bottom. Oxidation on the left, reduction on the right.



The #570 Variation 2 body with Yellow Ochre additions in 2% increments from top to bottom. Oxidation on the left, reduction on the right.



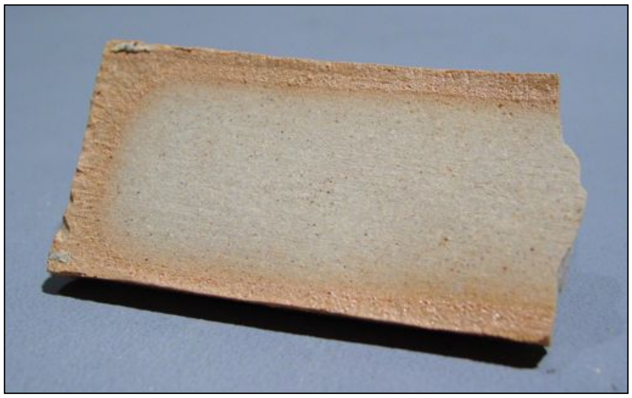
The #570 Variation 2 body with Pearl Ash additions in 2% increments from top to bottom. Oxidation on the left, reduction on the right.



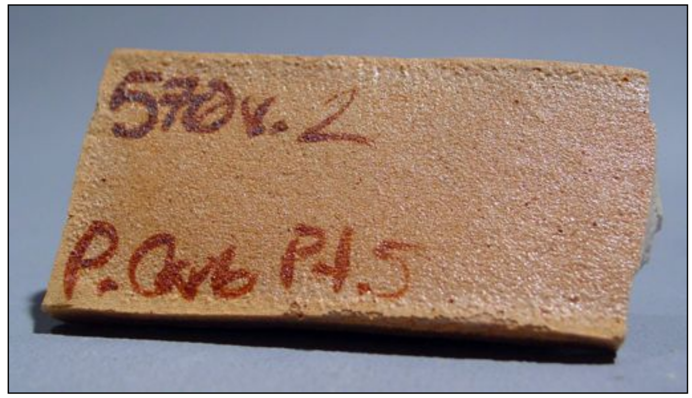
The #444 Variation 1 body with Red Iron Oxide additions in 2% increments from top to bottom. Oxidation on the left, reduction on the right.

The #444 Variation 1 body with Yellow Ochre additions in 2% increments from top to bottom. Oxidation on the left, reduction on the right.

The #444 Variation 1 body with Pearl Ash additions in 2% increments from top to bottom. Oxidation on the left, reduction on the right.

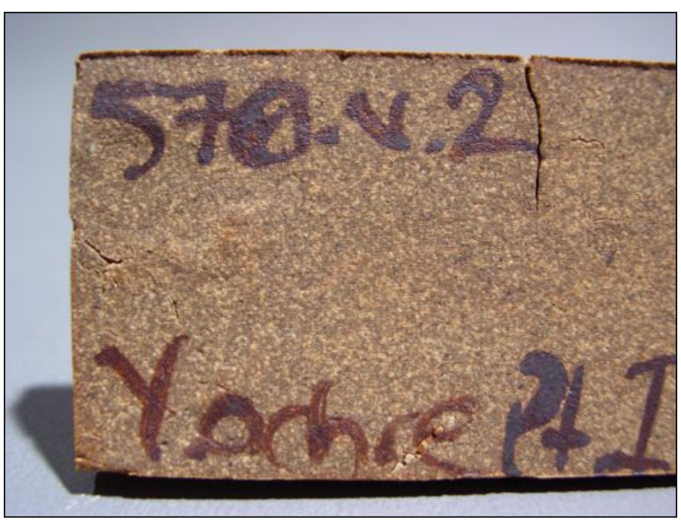


Soda Ash’s solubility affected its drying characteristics. This view from the underside of the tile with 10% Soda Ash, shows almost no deposit of Soda Ash.



The topside of the tile with 10% Soda Ash, shows so enough deposit that it created a glassy surface.

Cross-section of the above tile shows migration of Soda Ash to the surface.



One of my favorite tests... #570 Variation 2 with 2% Yellow Ochre.

Name: Sarah Nikitopoulos
Purpose of Research: Vitreous engobe for bisque ware
Firing Range: Cone 5-6

Recipe(s): Various

Final base recipe for all color variations:

Nepheline Syenite	10
OM-4	15
EPK	15
Frit 3110	30
Flint	30
Total	100%

Add:

CMC	1%

Development:

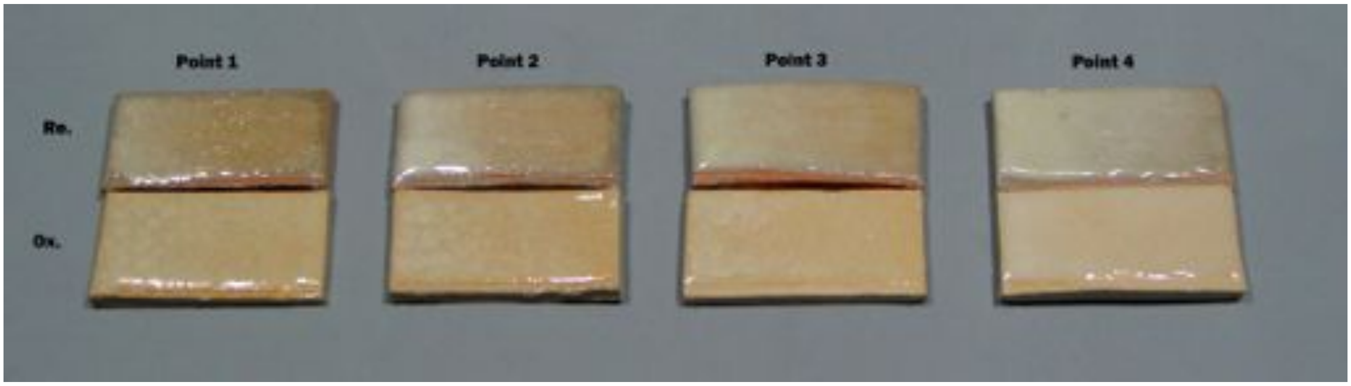
I wanted to develop an engobe for use on bisqued work that would vitrify a bit more than usual and not have a chalky or dry surface. I was interested in something with a bit of an orange peel texture as well.

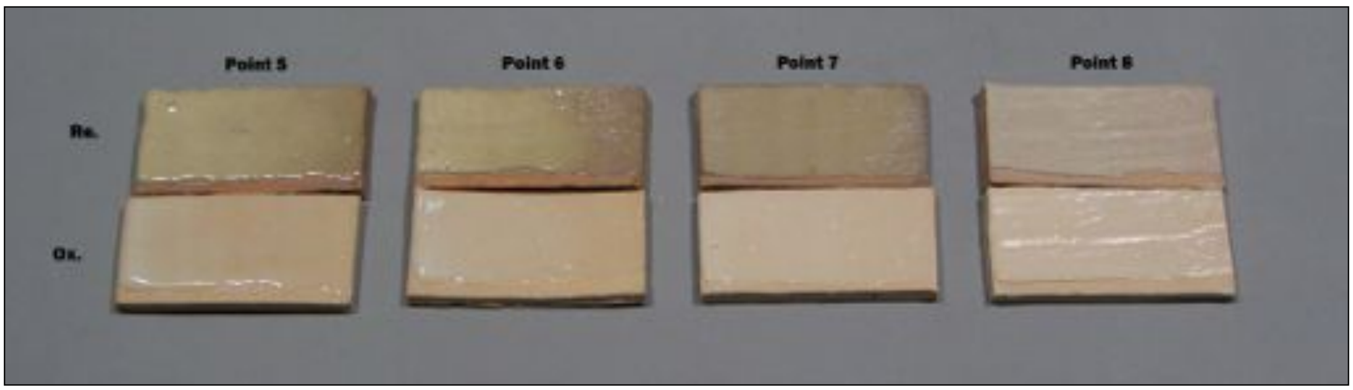
For the first test I did a line blend of a basic recipe we developed using Nepheline Syenite, OM-4 Ball Clay, EPK, Frit 3110, and Flint in order to get a variety of different surfaces to choose from. Having 30% clay in the recipe helped give strength and prevent major cracking when drying on the bisqued test tiles. The Nepheline Syenite and clays were kept constant while the frit and flint varied throughout the tests. I used boxed #444 clay for the test tiles and brushed the tests on from thick to thin, thick being around 4-5 millimeters. The result was a wide range of surfaces from a crazing, ice crystal looking glaze to a very dry, dusty surface that chipped off where thick.

Test 1:

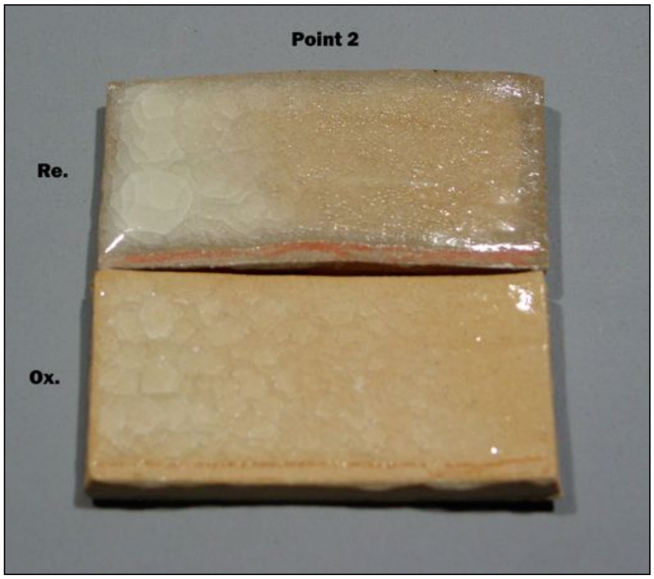
Point #	1	2	3	4	5	6	7	8	9	10	11	12	13
Neph. Sy.	10	10	10	10	10	10	10	10	10	10	10	10	10
OM – 4	15	15	15	15	15	15	15	15	15	15	15	15	15
EPK	15	15	15	15	15	15	15	15	15	15	15	15	15
Frit 3110	60	55	50	45	40	35	30	25	20	15	10	5	0
Flint	0	5	10	15	20	25	30	35	40	45	50	55	60

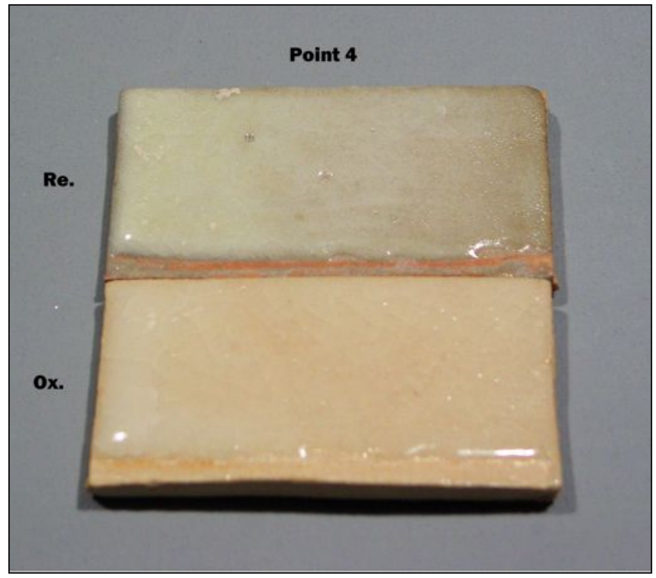
Results from Test 1:

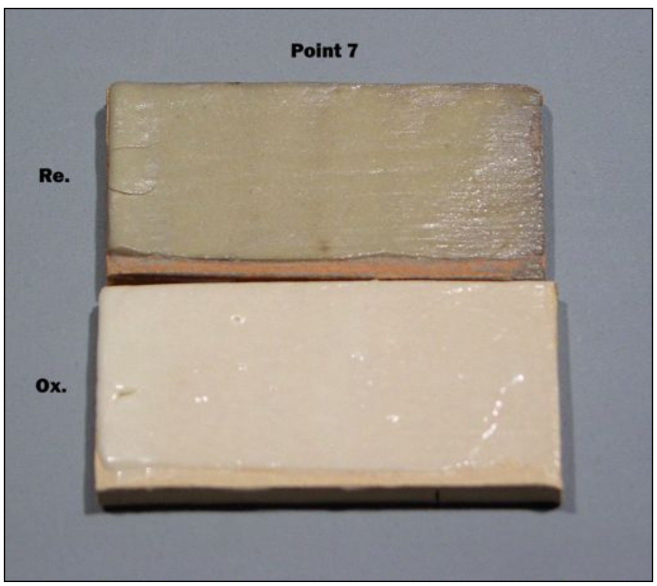




Detail views of points from test 1 for further testing:





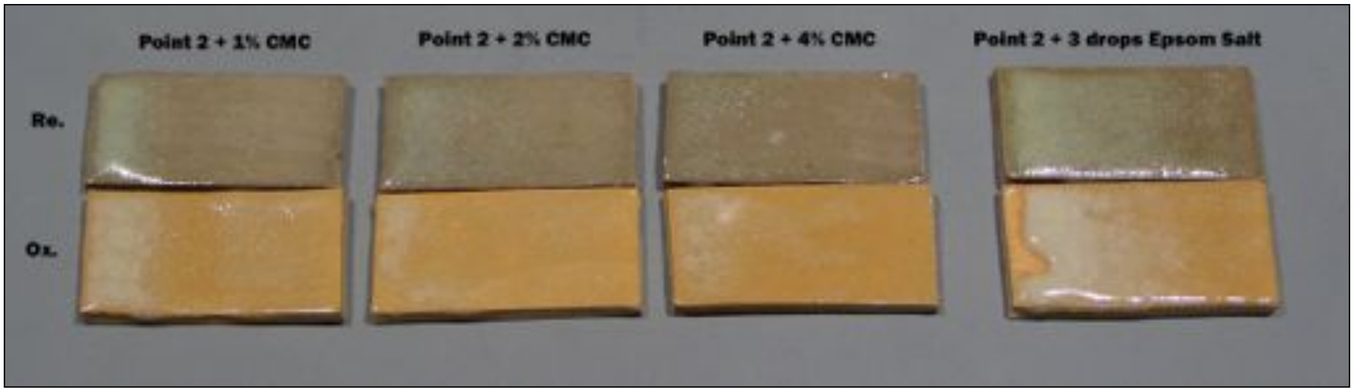


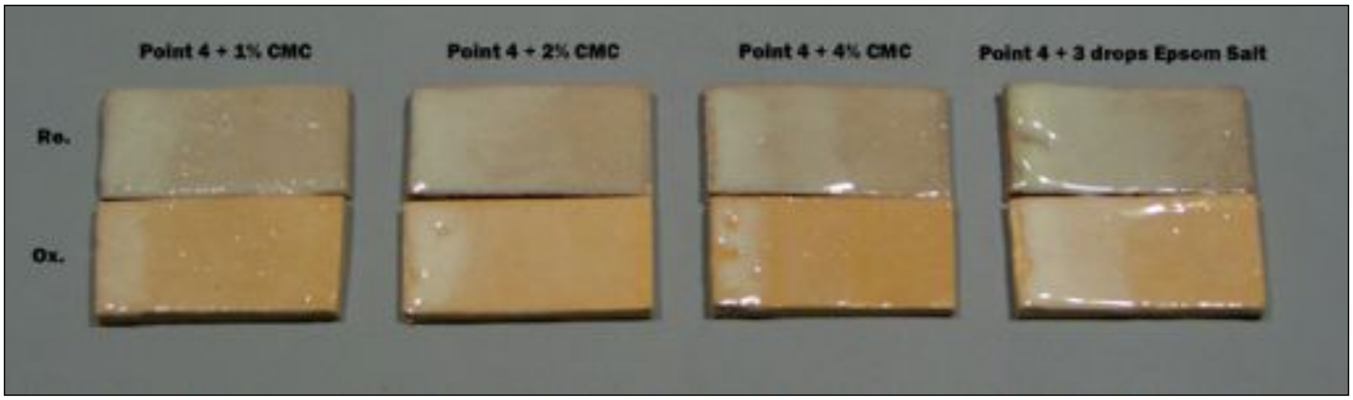
Detail of point 2 fired in reduction.

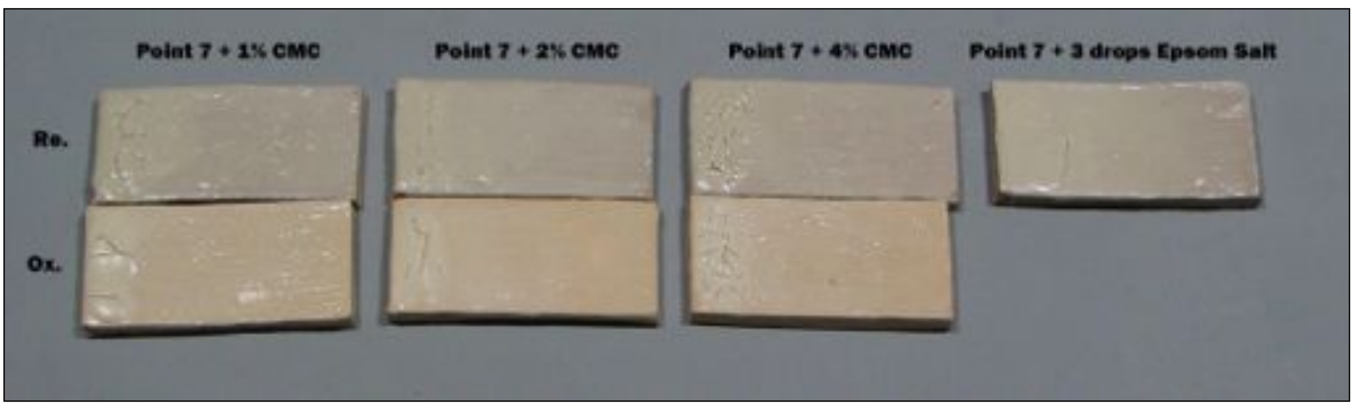
All of the engobes were difficult to brush on to the test tiles. They were very “dry” (like when brushing on a glaze), and held the streaks from the brush even after firing. I picked the three surfaces that I liked the most; point 2, point 4, and point 7, and then performed a second round of testing (test 2) intending to increase brushability by adding 1, 2, and 4 percent CMC gum as well as Epsom Salt .

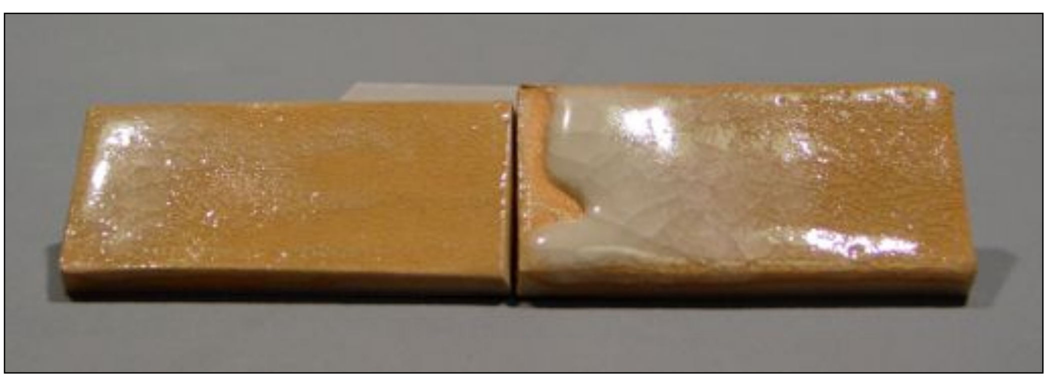
Brushability was noticeably improved with the additions of CMC. 1 percent seemed to be sufficient. 2 and 4 percent made the engobe needlessly gummy and was hard to keep up a thick surface; as it dried it kept leveling out across the whole tile. There was little improvement with the Epsom salt, it thickened up the engobe yet it was still very “dry” when brushed on. Test 2 also served as a trial to see how consistent the engobes would be from firing to firing; results from test 2 were similar to test 1 except for crawling in the very thick areas due to adding the CMC.

Results from test 2:





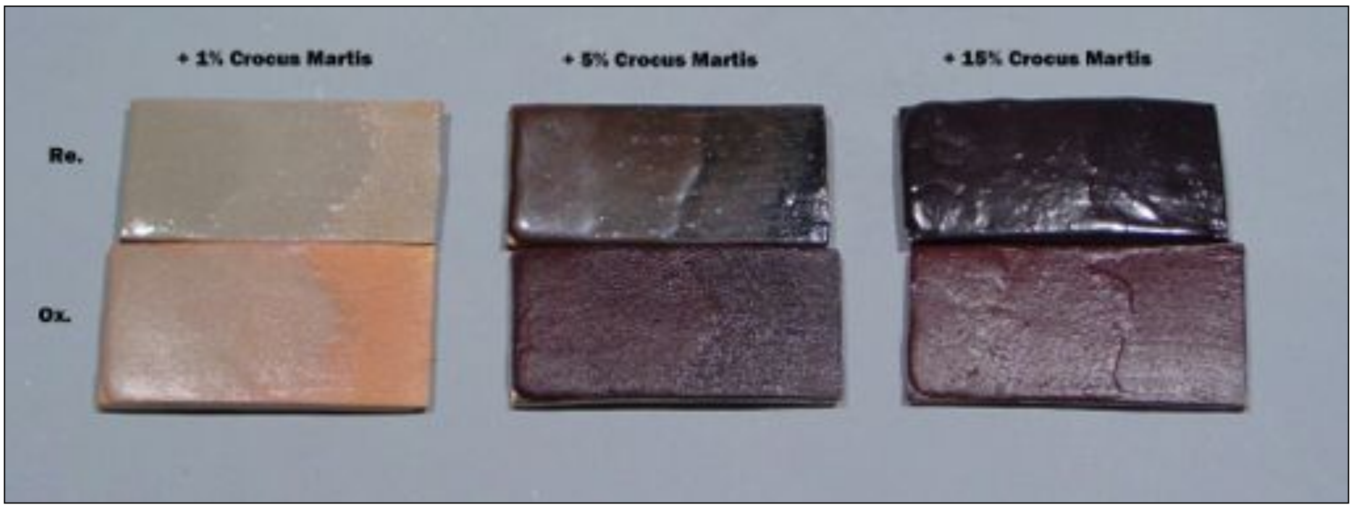


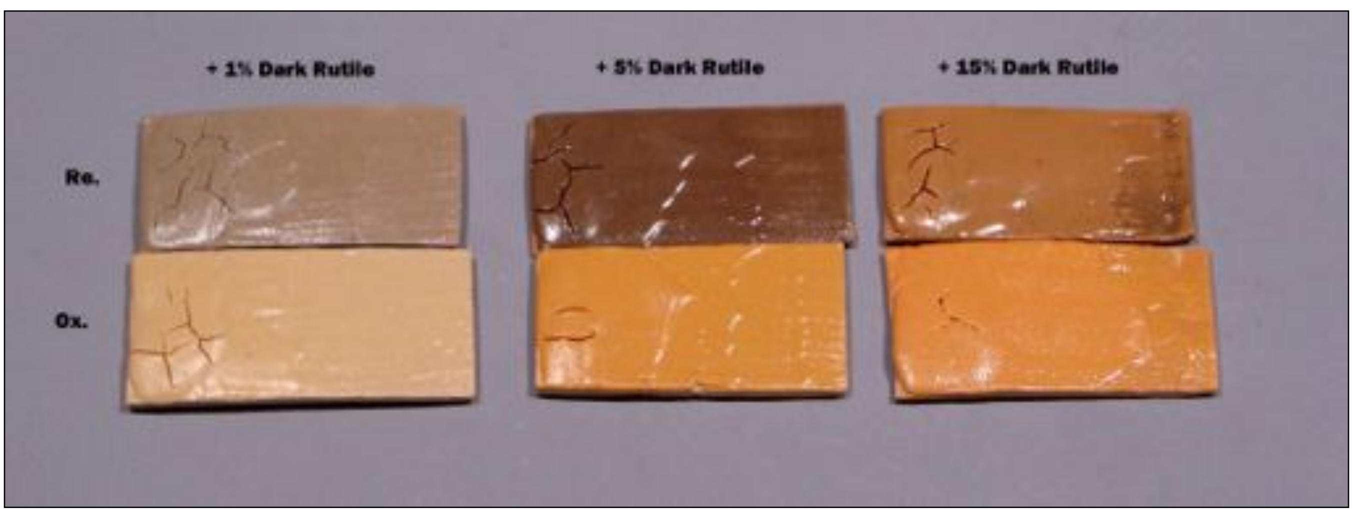


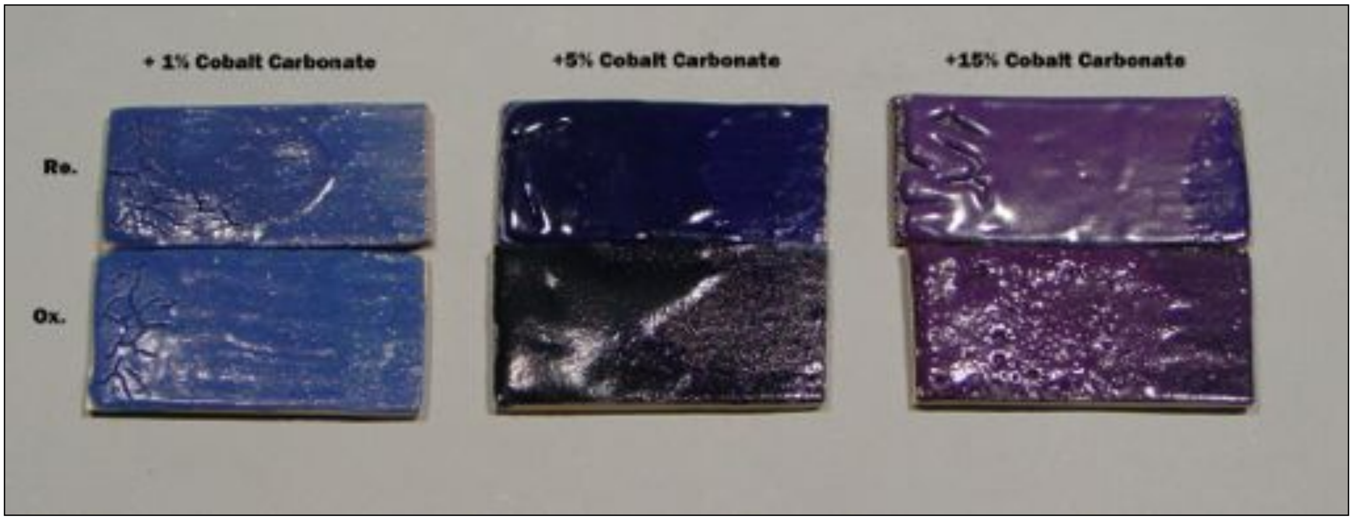
Comparison between adding 4% CMC (left) and Epsom Salt (right) in point 2. Note the difficulty in establishing thickness with the addition of 4% CMC.

For the third and final round of tests, I did a color run using point 7 from test 1 with a 1 percent addition of CMC. I added in increments of 1, 5, and 15 percent: Crocus Martis, Cobalt Carbonate, Dark Rutile, Copper Carbonate, Mason Dark Red stain, and Mason Sage stain. The tests for reduction yielded some interesting results, but perhaps even more interesting were those for oxidation, as the kiln under fired and only reached cone 5. A few of the surfaces had the orange peel texture I was interested in. It is interesting to note how some of the surfaces became a little glossier and smooth due to the colorant addition acting as a flux, while others acted refractory and produced a more matte or pockmarked surface.

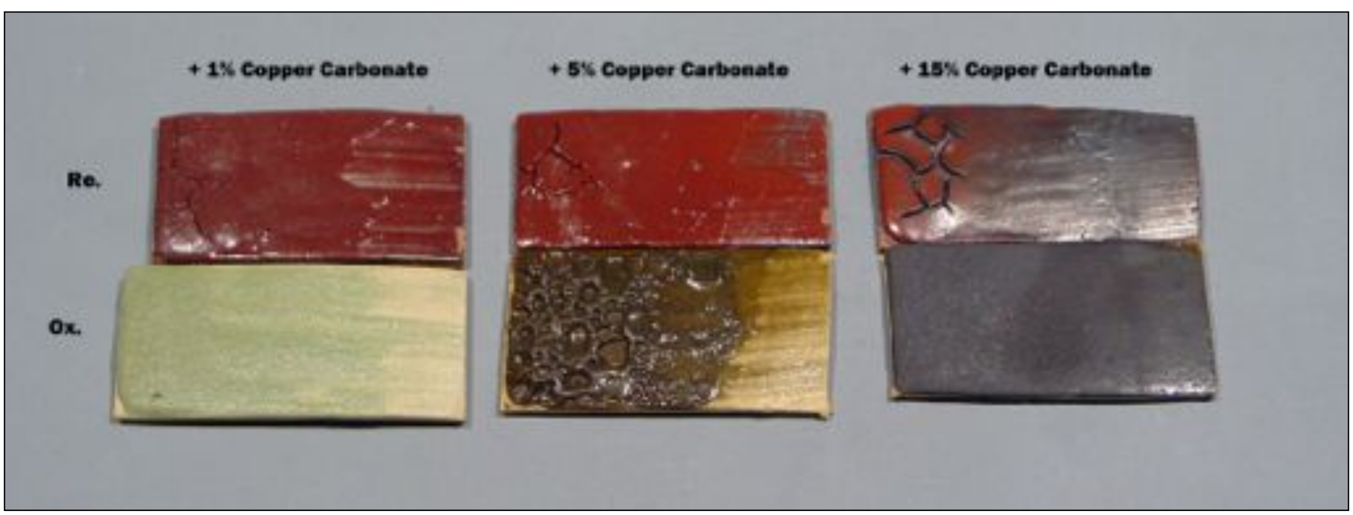
Results from test 3:







Note metallic surfaces of Mason Sage in reduction.



Detail of 5% addition of Crocus Martis fired in oxidation. Under fired to cone 5

Details of 15% addition of Cobalt Carbonate in reduction and oxidation. Oxidation test was underfired to cone 5.

Detail of 15% addition of Copper Carbonate fired in reduction.

Detail of 5% addition of Copper Carbonate fired in oxidation. Under fired to cone 5. Note the small chip in the cratering toward the bottom due to handling. This only seems to happen at a medium thickness; the cratering is quite dense and strong where very thick and is nearly impossible to puncture with a fingernail.

Detail of 15% addition of Mason Dark Red in reduction.

As for further investigation, it could be worth testing other points along the test 1 line blend for different surface options. A triaxial color run using multiple colorants may yield promising results. Point 2 from test 1 could be an interesting glaze when applied thick and would benefit from a color run. Firing variations could include firing to cone 5 in reduction, or re-testing all recipes at cone 5 or lower. Conversely, firing to cone 6 in oxidation may also yield interesting results.

In closing, I'm not sure if these are technically considered engobes. Maybe they are more like matte or textured glazes, but I'm pleased with the results regardless. Perhaps if a point was picked further down on the line blend in test 1 something closer to an engobe would have been achieved.

From test 1... Detail of point 2 fired in reduction.

Name: Rachel Ellsworth
Purpose of Research: Egyptian paste with paper burnout
Firing Range: Cone 04

Recipe(s): Various

Source of recipe	Hammer's Encyclopedia	Daniel Rhodes	Susan Peterson	Chappell EP-4	Chappell EP-7	Chappell EP-8	Chappell EP-10$_{\psi}$
Page Number	pg.115	pg. 319	pg.153	pg. 125	pg. 126	pg. 126	pg. 127
Temperature	C. 013-08	C. 08	C. 010-04	C. 08	C. 07	C. 06	C. 04
Tests	#1, A	#2, B	#3, C	#4, D	#5, E	#6, F	#7, G
Neph. Sy..	35	40	37		37	11	5
Hommel 14 (3134)				20			
Soda Ash	10	6	6		5	5	15
Sodium Bicarb.		6	6	6	5	5	
Borax						5	
Calcium Carb..		5					
Talc							20
Cornwall Stone							2.5
Kaolin (EPK)		15			12	47	20
Ball Clay (Tenn #10)	20	5	14			19	52.5
Bentonite				8	5		
Flint	35	20	37	66	33	23	
Sand		8					
CMC					3		
Total	100	105	100	100	100	115	115

Books cited for recipes:
The Potter's Dictionary of Materials and Techniques, Frank and Janet Hamer, Third edition, A & C Black Limited, 1993
Clay and Glazes for the Potter, Daniel Rhodes, Third Edition, Krause Publications, 2000
The Craft and Art of Clay, Susan Peterson, Fourth Edition, Laurence King Publishing Ltd, 2003
The Potter's Complete Book of Clay and Glazes, James Chappell, Revised Edition, Watson-Guptill Publications, 1991

Development:

I wanted to find a way to build using slip and paper, where the paper would burn out leaving a fragile lacy looking piece. I decided that it would make sense to use a self glazing body due to the fragility of the piece, and to the advantages of once-firing. I decided to work with Egyptian paste as a solution to the once fire idea. I knew that adding colorants would change the recipes so I decided to do each sample with a colorant and without.

I started with 7 recipes for Egyptian paste, all with different firing ranges. Without changing their recipes, I wanted to see what they did at cone 04. I mixed 300g batches of each recipe twice. In one batch of each of the seven recipes I added 3% of copper carbonate (designated A, B, C... etc in this series). In order to completely dissolve the Soda Ash and Sodium Bicarbonate, I made 14 containers with 30% boiling water and added the Soda Ash first, let it dissolve and added the Sodium Bicarbonate second and let it dissolve. Those each sat while I dry mixed the rest of the recipes in separate containers and then added them to the fully dispersed water. I added more water as necessary; wet mixed them and left them out until they reached plasticity.

Clay's #6, #7, F, and G, took much longer to reach plasticity and clay's #5 and E never did completely homogenize and dried on their surface, but stayed very wet on bottom so I did not continue on with them, bringing my tests down to 12 bodies.

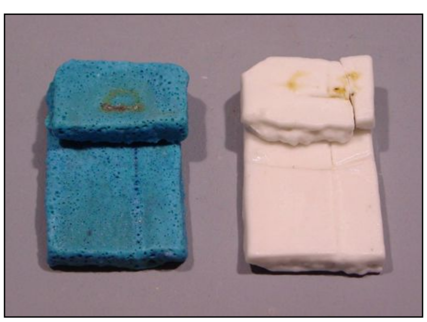
The sodium in most of the bodies formed crystals all over the top surface that I just had to mix and wedge thoroughly back in to the clay body. These crystals are very important because they are what form the glaze on the surface of the fired piece. From each of the clays I made tiles to test for slumping but recipes 3 and 4 cracked so I had to cut them shorter. In doing this, the tests didn't show any slumping but later tests did, so I know my first tests should have been longer to show true slumping amount.

The tests were helpful in that they showed the amount of self-glazing, that none of them would completely melt away at cone 04, the way they looked with and without a colorant, and how the colorants would affect the make-up of the bodies. Bodies #7 and G did not fire completely out due to the high percentage of Soda Ash in the recipe; some fuzzy crystallizing still remained on the surface after firing (pictured below). The effect of the copper carbonate on #4 (aka D) would not be ideal for the way I wanted to use it, but still had an interesting effect that could be looked at further for other means (pictured below). The undersides of the colored bodies were a brown color where they dried last. This is where the sodium could not crystallize and cause a glazing effect. Further research could be done on how rubbing the crystals off of some areas might be used esthetically to create variations in colors.

A #1

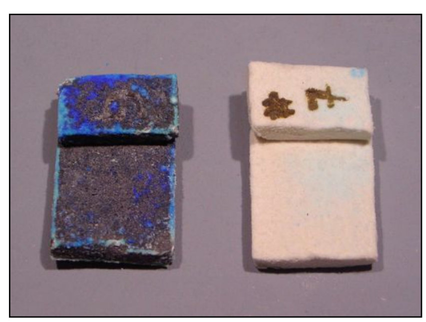
B #2

C #3



D #4

F #6

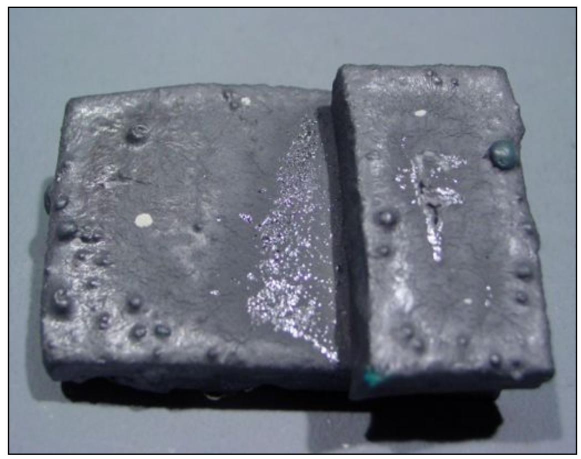


G #7

Detail of Test #1

Underside view of Test A

Detail of Test D



Detail of Test F

Detail of Test #7

From these tests, I chose three of the twelve with which to continue my research. The ones I chose were #4, A and C. From these I made 1000 gram samples in slip form without a dispersant. With each slip I did a series of tests by taking crumbled pieces of standard drawing paper and applying the Egyptian paste in the following ways:

1. Dipping it once
2. Dipping it twice
3. Dipping it three times
4. Brush coating it once
5. Brush coating it twice
6. Brush coating it three times

With these tests I was trying to see how well they kept their shape, how they looked around the edges, what the bottom looked like (where salts wouldn't surface, causing no glaze), the best way to apply the slip to the paper and how much weight the paper could hold before losing its shape. Each sample did varying things at each stage:

Test #4 was very transparent and seemed to hold its shape better with less dipping and didn't crack as much when applied thinner. This formula was amazingly transparent and held its shape very well. It looked calcified and bone like without containing any calcium based component. All variation on #4 appeared flat matte with random small lightly glossed edges (not throughout entire piece). It was also the only sample of the original 7 bodies that did not have soda ash.

Dip application

Brush application

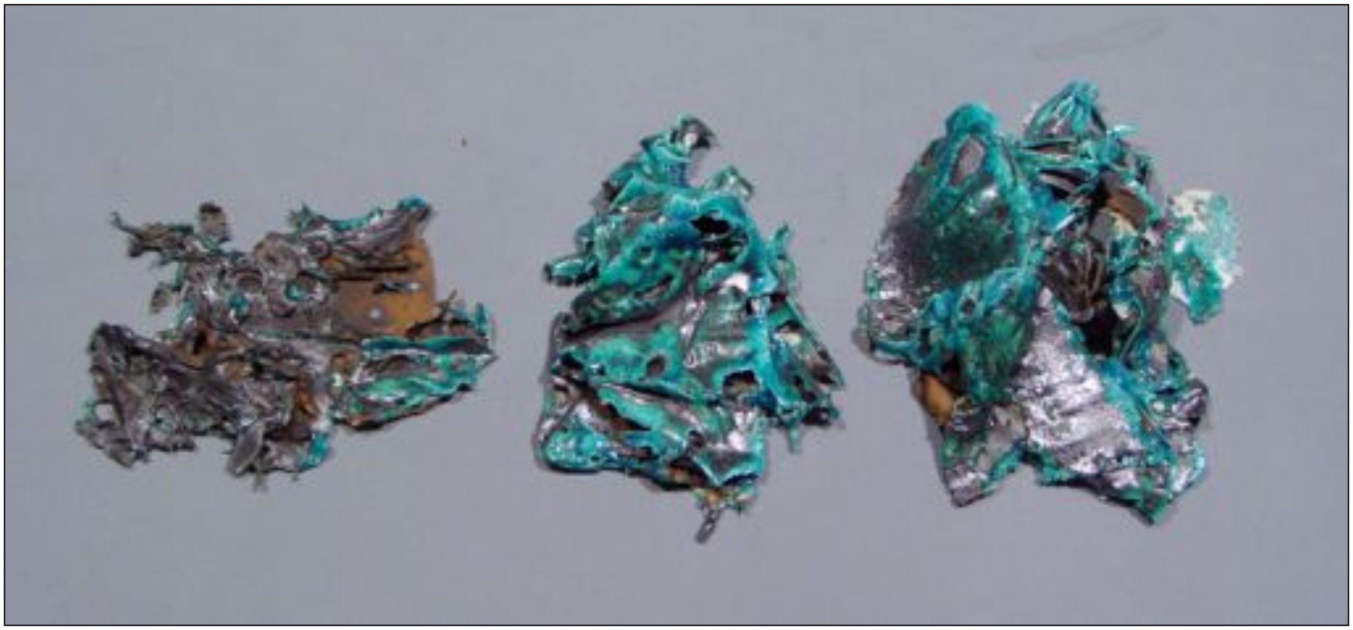
Detail of test with 1 dip

Detail of test with 1 brushed coat

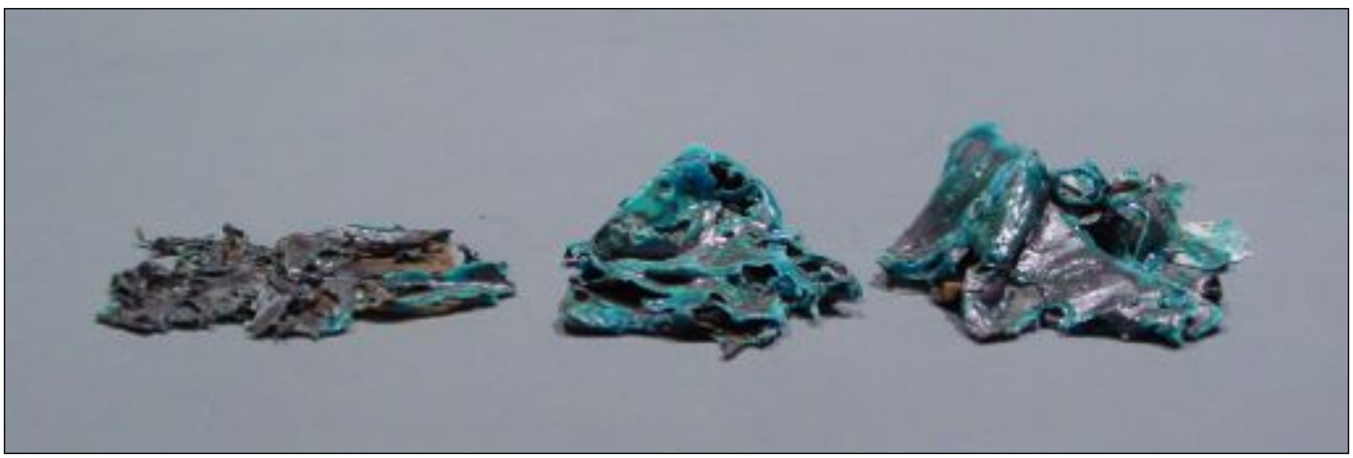
Detail of transparency on test with 1 brush coat

Regarding recipe A, 1 dip didn't cover enough surface area and 3 dips caused slumping. 1 brush coat completely melted because when paper burnt out it was too thin to hold its shape but it still made a beautiful spider web-like flat piece (pictured below). 2 dips seemed to work best. The edges on this piece had teeth to them and were very jagged (pictured below). The copper did amazing things in the areas it pooled in and had a metallic dark silver to it. The blues in the thinner areas are gorgeous.

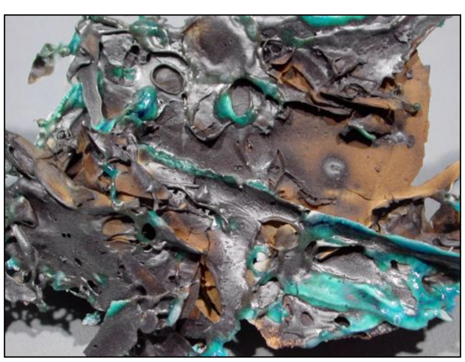
Dip application



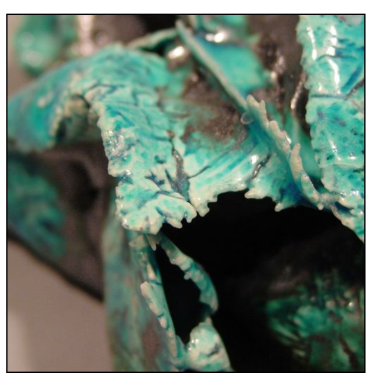
Brushed application (top view)



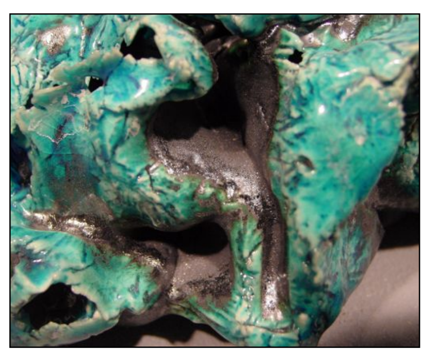
Brushed application (side view)



Detail of test with 2 dips. Note the pooled areas.



Detail of test with 2 dips. Note the jagged edges.



Detail of test with 1 brush coat

Recipe C was a lot like recipe A with the main difference being that C had both Soda Ash and Sodium bicarbonate and A only had Soda Ash in it. This may be the cause of the tooth like edges on A. C does not have them at all. C's edges are very smooth and the dipping effects were similar to A's results (one coat wasn't enough, three was too many). The same thing happened with just one brush stroke in that it resulted in a pile resembling a flat spider web.

Dipped application

Brushed application

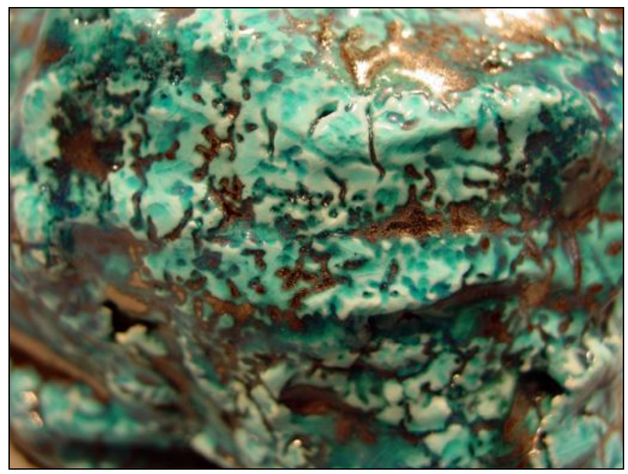
Detail of test with 1 brushed coat.

Detail of test with 1 dipped coat.

Underside of test with 2 brushed coats.

From these results I chose my favorite of the three and did further research on how to build with them. I decided to work with recipe A because I really liked the jagged edge results. I made two 500 gram samples, one with copper carbonate and one without. With each sample I varied ways of building. I wanted to see how sturdy they would be when built, how much each piece would slump, if both sides of paper had to be painted in order for shape to be maintained, how different types of paper changed results and how they looked when layered.
The following objects were made with the copper carbonate recipe, using specific techniques as describe below...

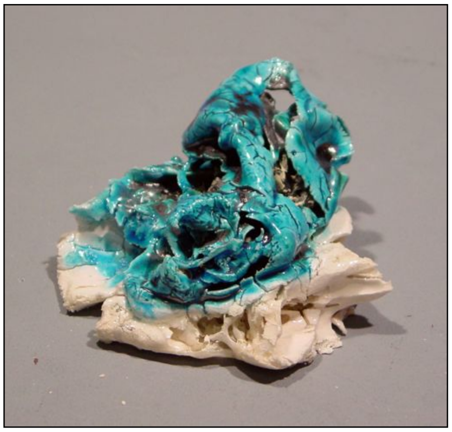
Paper Mache on round balloon (using tissue paper covering entire balloon up to an inch before tie off)



Detail of image on left.

Larger piece of drawing paper one side coated wrapped into a loop

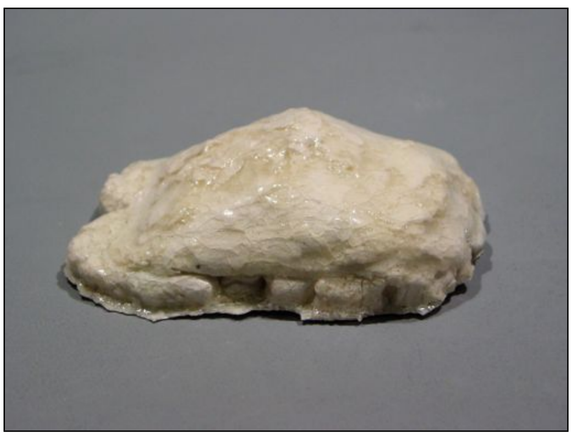
Small piece of paper wrapped into loop with both sides coated (using newsprint)



Crumpled piece dipped in slip placed on top of other crumbled piece dipped in slip without copper carbonate.

Detail of image on the left.

The following objects were made without copper carbonate recipe, using specific techniques as describe below...



Tissue paper coated in slip and layered tall as if brick-like

Detail of image on the left.

Paper mache on long balloon base (bowl like).

I had some left over slip of #4 and, because I liked the effects of it from previous tests, I decided to try it on a sheet of fiberglass someone had lying around. The effects were exactly the lacy idea I was going for. I plan to do further research on this idea and to see how I can build with it.

Fiberglass dipped in #4.

Detail of image on the left.

Building with the paper mache worked well because it gave the paper a structure to harden around and then release itself from while still maintaining its shape. The problem with the larger balloon was that it kept popping too soon when the stuff was still too wet to maintain it shape. Coating one side of the paper does not work even when done thick. Both sides need to be coated as done with smaller one that still remained its shape whereas the larger one completely burnt out and looked much like the samples where only one brush coat was used. Layering the pieces on top of one another does not cause a lacy see through effect but looked more like a mound of opaque glass.

Further testing with thicker paper might obtain more lacy results. I was very satisfied with my results but would like to do further testing and perfect the best ways to work with the materials and find more materials to use as well. Testing could go further in ways of building, color variations, how to use thinly coated paper on pieces and possibly developing ways of transferring spider web look.

Name: Callard Geller
Purpose of Research: A slip for dipping and burning out packs of cigarettes
Firing Range: Cone 6 Ox.

Recipe(s):

Foundry Hill Cream	10
C+C Ball Clay	19
Custer	20
Flint	10
Grolleg	25
Tile 6	16
Total	100%

Add:

Darvan 7	0.5%
Epsom Salt Solution	0.05%

Plus one of the following...

Nylon Fibers	0.3%
Paper Fibers (rung slightly to remove water)	7.5%
Wollastonite	4.25%

Development:

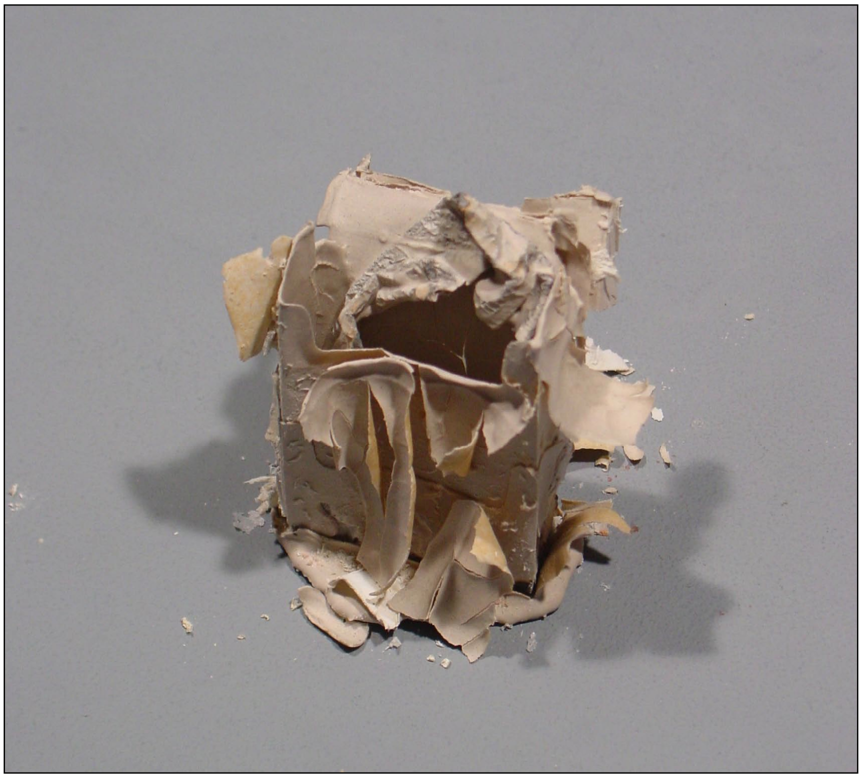
I was trying to develop a slip body that would coat the packs of cigarettes and hold together as a paper burned out.

I started by researching slip bodies, taking a cone 10 dipping slip and reformulating it to cone 6. I then did a dispersant test to find right amount of Darvan 7. Additions of Epsom salt solved the problem of the slip pooling at the bottom of the objects. Having done this, I then experimented with additions of different fibers to hold slip together while the paper burned out.

I did three line blends of different fibers. Paper and Wollastonite were more successful then nylon, with Wollastonite being stronger in the end result.

If I knew at the beginning what I know now, having done the tests, I would have figured out a more consistent way of dipping or spreading the slip in the packs of cigarettes.

For future testing, I would suggest increasing the percent of fiber in the mix as well as developing some mix of fibers to hold the slip together. Also, figuring out some system for burning out the paper with out disturbing the slip might prove more successful.



Before addition of Epsom Salt. Note the pooling of slip at bottom.

After addition on Epsom Salt. Note that the burning out of the paper destroys the slip.

Detail of ash created by burnt tinfoil inside cigarette pack.

Pack with addition of Nylon Fibers
Note: Although was not strong enough to hole slip together in the amount nylon had less of an affect on the texture on the finished product.

Pack with addition of paper fiber
Note: Stronger final product then nylon fiber however not as strong as Wollastonite.

Pack with addition of Wollastonite. This was the strongest of tests, with the least cracking on surface. However, the Wollastonite also disrupted the texture of the slip.

Name: Haakon Lenzi
Purpose of Research: Wet application slip
Firing Range: Cone 6 Ox.

Recipe(s):

New Zealand Kaolin Slip	
Ultrafine H	45.0
Tennessee #10	10.0
G-200	28.8
Flint	16.2
Total	100%

White Slip	
Tile 6	25
EPK	25
Grolleg	15
Neph. Sy.	23
Flint	12
Total	100%

Development:

The purpose of my research was to come up with two different slips to be applied during the leather hard stage to the 570 body, commercial mason stains were then added for color. One of the two base slips was a whit slip, while the other used the New Zealand Kaolin.

Mason Stains were added in 10% additions...

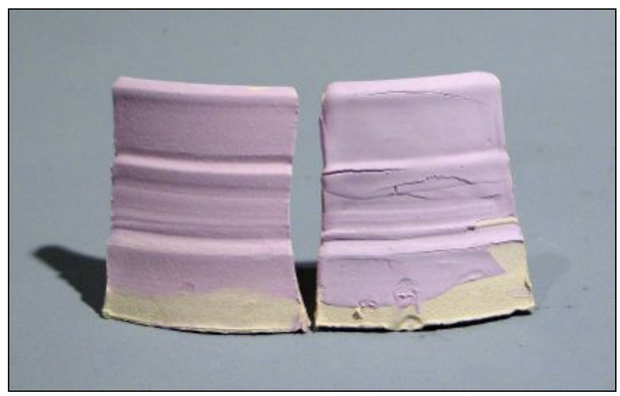
Mason Dark Red- 10%
Mason Nickel Silicate - 10%
Mason Best Black- 10%
Mason ZR VN Blue - 10%
Mason Pink- 10 %
Mason Violet- 10%

After the initial testing of my base slips both slips broke on the edges of the test tiles. However these test were only demonstration one dip. After adding the colorants to the slips, the test tiles were dipped twice. The second test showed that the fit was inadequate, as the slip flaked off most of the tiles. In the future I would modify the base slips to get a better fit as well as increase the percentage of mason stains.

For all samples: White Slip on the left, New Zealand Kaolin Slip on the right.

Base slips

Mason Pink



Mason Violet

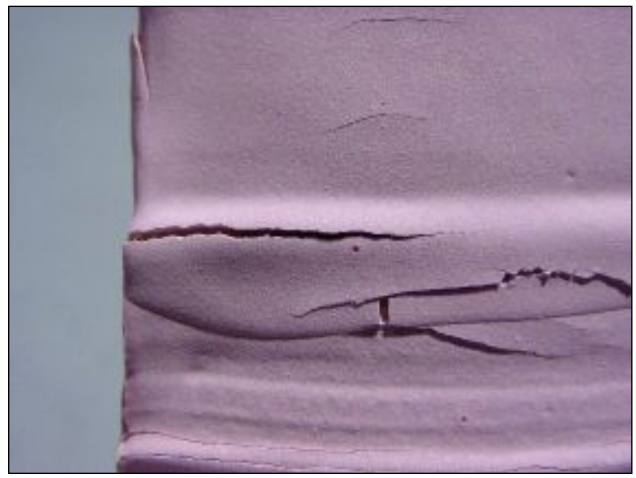
Mason Zr Vn Blue

Mason Nickle Silicate

Mason Best Black

Mason Dark Red

Detail of Mason Violet on in White Slip base



Detail of Mason Violet on in New Zealand base

Detail of Mason Violet in New Zealand base. Flaking away sections reveal no contact with underlying clay surface.

Detail of Mason Best Black in New Zealand base shows the curling and separation of slip from clay body

Class Evaluation of...

Potluck Clay bodies

Developed by:	Sharie and James (Group 1)
Type:	Throwing
Color:	White (!)
Texture:	Smooth
Cone:	Cone 6 Ox. or Re.

Recipe:	Ultrafine H	43.6
	Tennessee #10	9.7
	G-200	32.8
	Flint	10.9
	Veegum	3.0
		100%

Wet to dry Shrinkage: 8.6% Absorption: 0.1%
Dry to fired Shrinkage: 10.2%
Total Shrinkage: 18.8%

Class Ratings:

Very Poor	Poor	Average	Good	Very Good
1	2	3	4	5

Throwing:
(7 students surveyed)

Plasticity	3.7
Building Strength/ Resistance to slumping	3.4

Hand Building:
(3 students surveyed)

Plasticity	4.0
Building Strength/ Resistance to slumping	3.0

What the critics are saying...

"Holds form well with little cracking. Pieces attach nicely to one another."

"...Strange drying properties..."

"I compressed my objects well, but they still cracked!"

"Cracked easily when pushed even slightly. Not fun to throw."

"Difficult to throw with but very beautiful. Perhaps just the nature of porcelain."

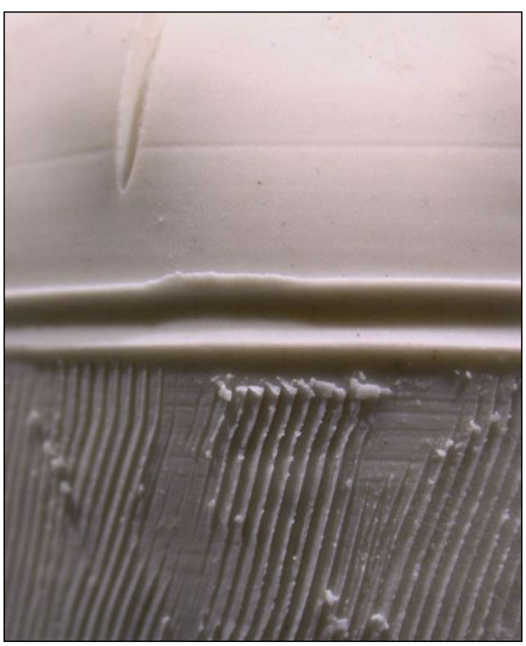
"Weird to work with (sticky)... but threw really well!"

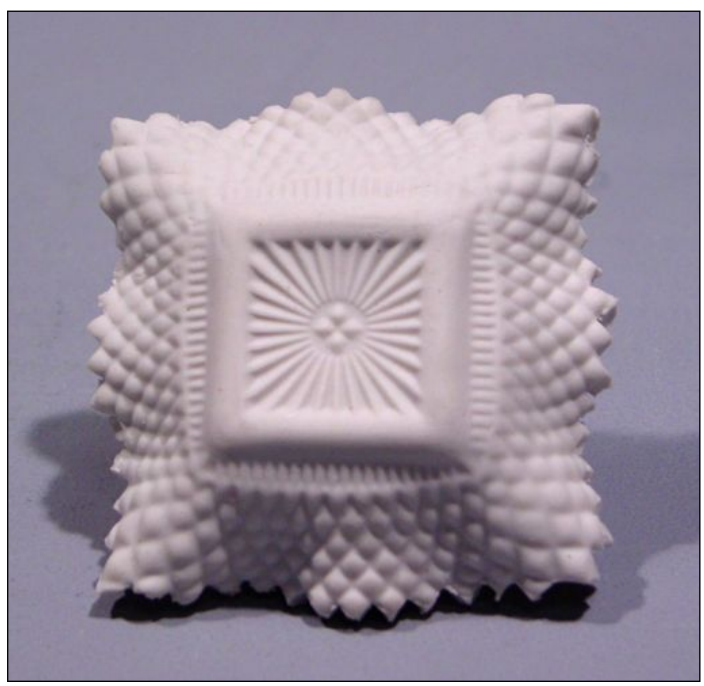
"Love it! Like 'buttah'. Would add less Veegum next time..."

"Body was nice to throw and had good vertical strength".

"Very smooth. Nicely vitrified and dense surface after fired. Had weird cream cheese consistency like most porcelains do."

"It's very slippery so I'm not sure it would be great for hand building. Press molds very nicely and really holds onto detail."





Developed by:	Rachel and Sarah (Group 2)
Type:	Throwing
Color:	Brown
Texture:	Semi-rough
Cone:	Cone 04 Ox.

Recipe:	Lizella Clay	29.93
	C&C Clay	14.96
	EPK	14.96
	Frit 3124	24.24
	Talc	6.41
	Flint	4.75
	Fine Grog	4.75
		100%

Wet to dry Shrinkage: 6.6%
Dry to fired Shrinkage: 4.1%
Total Shrinkage: 10.7%

Absorption: 0.69%

Class Ratings:

Very Poor	Poor	Average	Good	Very Good
1	2	3	4	5

Throwing:
(7 students surveyed)

Plasticity	3.0
Building Strength/ Resistance to slumping	4.3

Hand Building:
(4 students surveyed)

Plasticity	3.3
Building Strength/ Resistance to slumping	4.3

What the critics are saying...

"Great color... gets a little chalky as it dries out."

"Gritty body, a lot of tooth, a lot of wet strength."

"Very groggy for throwing, but easy to pull up."

"Cracks too much in press mold and doesn't show detail well because of cracking."

"Baby poop! Groggy. Threw OK, but not as easy to form."

"Some cracking when coil building. Holds form well and pieces attach very nicely. Overall good hand building body."

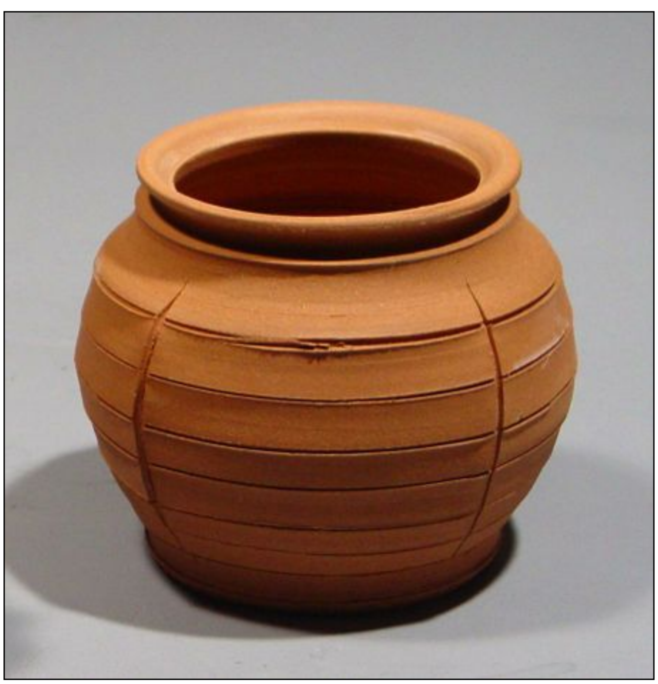
"Some scumming on edges of piece (Didn't affect glazing)."

"Would not recommend for inexperienced throwers."

"Very 'open' when throwing. Have to be careful not to use too much water."

"This clay hurt my hands!"

"Very resilient but the grog made this one painful to throw for long periods of time."



Developed by: Johnathan and Kaye (Group 3)
Type: Throwing
Color: Off-white
Texture: Smooth
Cone: Cone 6 Ox.

Recipe:

Foundry Hill Creme	15.54
XX Sagger	15.54
Goldart Clay	31.08
Custer	21.04
Flint	12.60
Fine Grog	4.20
	100%

Wet to dry Shrinkage: 8.7%
Dry to fired Shrinkage: 6.0%
Total Shrinkage: 14.7%

Absorption: 1.17%

Class Ratings:

Very Poor	Poor	Average	Good	Very Good
1	2	3	4	5

Throwing:
(8 students surveyed)

Plasticity	4.0
Building Strength/ Resistance to slumping	3.5

Hand Building:
(1 students surveyed)

Plasticity	5.0
Building Strength/ Resistance to slumping	5.0

What the critics are saying...

“Very smooth and silky for a stoneware. Nice lightly speckled surface.”

“Average body.”

“I really enjoyed this body. Nice for throwing... beautiful fired color.”

“Speckles!”

“Press-molds very nicely and holds detail well. Cuts smoothly and wedges well.”

“Average stoneware... a little short.”

“Handles nicely and has good workability... attaches well, good for hand building, not very coarse.”

“Great stuff!”

“Not great but not bad either.”

“Held itself up in thin areas... good for pushing around... good for beginners, soft on the hands.”

Developed by:	Allison and Caitlin (Group 4)
Type:	Throwing
Color:	Red
Texture:	Smooth
Cone:	Cone 04 Ox.

Recipe:

Redart Clay	28.0
Yellow Banks #101	28.0
OM-4	14.0
Frit 3124	22.5
Talc	7.5
	100%
Add:	
Barium Carbonate	0.4%

Wet to dry Shrinkage: 6.9%
Dry to fired Shrinkage: 3.3%
Total Shrinkage: 10.2%

Absorption: 0.64%

Class Ratings:

Very Poor	Poor	Average	Good	Very Good
1	2	3	4	5

Throwing:
(6 students surveyed)

Plasticity	3.0
Building Strength/ Resistance to slumping	2.7

Hand Building:
(3 students surveyed)

Plasticity	3.3
Building Strength/ Resistance to slumping	3.7

What the critics are saying...

"Generally average. Some slumping. Nice color."

"Color is great!"

"...I also threw with it and like it better than any red body I've ever thrown."

"I had a hard time constructing a handle. This clay kept cracking. Pinching seemed to work better than coil building."

"Press molds well with little cracking. Cuts smoothly and wedges nicely."

"This was lousy. It slumped a lot."

"Not impressed. Not a lot of wet strength."

"Very hard to throw."

Developed by:	Callard and Haakon (Group 5)
Type:	Throwing
Color:	Blue
Texture:	Semi-smooth
Cone:	Cone 6 Re.

Recipe:

Helmer Kaolin	25.31
Grolleg	25.31
C&C Clay	9.93
G-200	25.31
Flint	8.43
Molochite (200 mesh)	4.96
Cobalt Oxide	0.75
	100%

Wet to dry Shrinkage: 7.7%
Dry to fired Shrinkage: 7.0%
Total Shrinkage: 14.7%

Absorption: 0.76%

Class Ratings:

Very Poor	Poor	Average	Good	Very Good
1	2	3	4	5

Throwing:
(8 students surveyed)

Plasticity	3.3
Building Strength/ Resistance to slumping	3.1

Hand Building:
(2 students surveyed)

Plasticity	4.5
Building Strength/ Resistance to slumping	4.5

What the critics are saying...

"I really enjoyed this body. I felt in control."

"Very plastic, dried quickly, easy to build with. Would recommend for hand building."

"Throws great... didn't like the color."

"Not very good for press-molding. Doesn't grab detail well and tends to crack when pushed."

"Difficult to throw. Seemed weak. Also cracked easily."

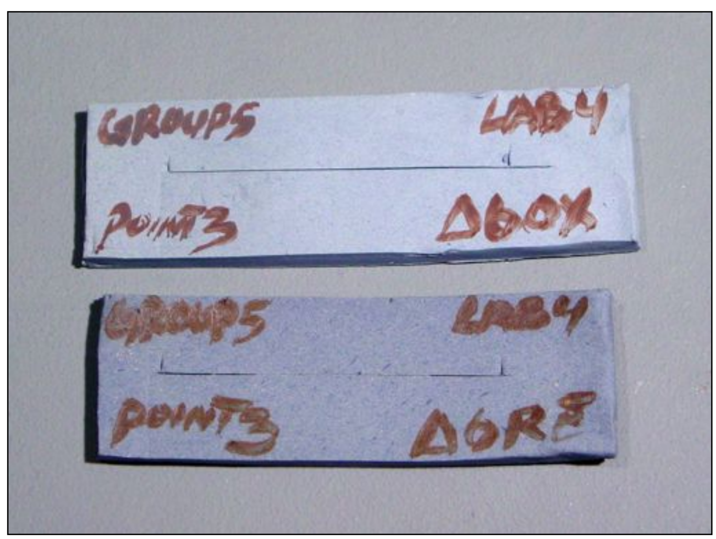
"Love the blue."

"Beautiful color. Slumping was the only issue."

"...I thought it threw the best!"

"Nice to throw with. Very smooth like a porcelain without the annoying cream-cheese consistency."

"Very hard to throw. Way too soft (maybe with more drying time it would be better). Slumped, couldn't keep shape while throwing."



Top tile was fired in oxidation; bottom tile was fired in reduction.

Developed by: Nicole and Cassandra (Group 7)
Type: Throwing and Hand building
Color: Dark Red
Texture: Smooth
Cone: Cone 6 Ox.

Recipe:

Redart Clay	18.3
Yellow Banks #101	18.3
Lizella Clay	36.6
Hawthorne Bond (35 mesh)	4.31
Flint	8.61
Fine Grog	5.07
Black Iron Oxide	8.81
	100%

Wet to dry Shrinkage: 6.0%
Dry to fired Shrinkage: 6.1%
Total Shrinkage: 12.0%

Absorption: 0.58%

Class Ratings:

Very Poor	Poor	Average	Good	Very Good
1	2	3	4	5

Throwing:
(8 students surveyed)

Plasticity	2.9
Building Strength/ Resistance to slumping	3.0

Hand Building:
(2 students surveyed)

Plasticity	3.0
Building Strength/ Resistance to slumping	3.5

What the critics are saying...

"Dirties everything it touches. Presses OK, but shows small cracks that can obscure detail."

"Not great... not awful. Difficult to attach hand build pieces onto thrown pieces."

"Slumped, difficult to keep its shape. Messy!"

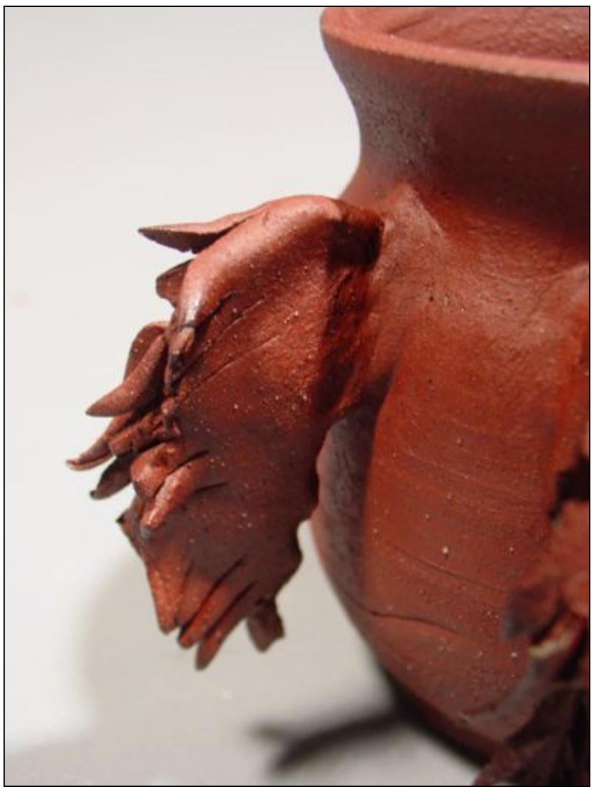
"Sticky and terribly messy to work with. Great fired color!"

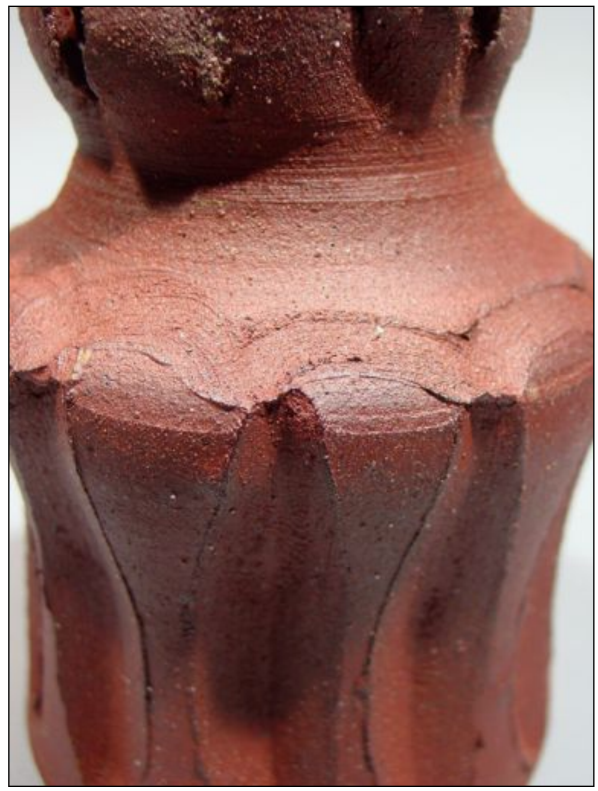
"Cracked when used to throw a slab."

"It was not pleasant to work with this: there was a point I got to where the body was literally ripping".

"Strange texture."

"Short, very messy. Hard to throw visually. Hard to see shape and detail while on the wheel."





Developed by: T.J. Samuels and Chen Fei (Group 8)
Type: Throwing
Color: Off-White
Texture: Smooth
Cone: Cone 04 Ox.

Recipe:

Tile-6	12.88
Tennessee #10	12.88
EPK	25.76
Frit 3124	33.34
Flint	4.03
Molochite (200 mesh)	11.11
	100%

Wet to dry Shrinkage: 6.2%
Dry to fired Shrinkage: 6.3%
Total Shrinkage: 12.5%

Absorption: 0.84%

Class Ratings:

Very Poor	Poor	Average	Good	Very Good
1	2	3	4	5

Throwing:
(8 students surveyed)

Plasticity	3.9
Building Strength/ Resistance to slumping	3.9

Hand Building:
(3 students surveyed)

Plasticity	4.0
Building Strength/ Resistance to slumping	3.7

What the critics are saying...

"One of the best! Don't care for the color too much though."

"Perfect!"

"Average. Okay to throw. Stood up relatively well to manipulation after throwing."

"Seems to be very sensitive to how much water you add while throwing. Once you get the shape you want it is easy to alter. Very soft on the hands."

"Favorite of all tests. Held shape well. Easy to form, no slumping - yay!"

"Nice to work with."

"Hard to get coils to stick (when coil building). Cracks easily."

"Thin press molds are not as nice because of too much cracking... thicker press molds hold up much better. Compresses nice."

"Very nice for throwing... I wish it weren't low fire."

"Great throwing body. Easy to pull up. A lot of wet strength."