

A Thesis Presented to the Faculty of Alfred University

Textured and Colored Glazes

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I focused my honors thesis research on three types of ceramic glazes, lichen, lava, and gloop. These became especially interesting to me after I took a glaze class a few years ago. I decided to take the glaze class because I absolutely hated glazes, but started enjoying ceramics. I didn't like how with glazes, unlike a painting, I couldn't see exactly how they were going to look after being fired. I figured I would learn a little more about them so it wasn't a dreaded part of working with clay. Instead, it became what I've been most focused on for the past few years.

My glaze testing is focused on three different temperatures: cone 04, cone 6, and cone 10. Cone 04 is the lowest temperature I fired glazes to, at 1945 degrees and all glazes used are considered low-fire glazes. The Cone 6 glazes are fired to 2232 degrees, while glazes at cone 10, the highest temperature, were fired at 2345. I tested significantly more colors and layering at cone 6 because I am most interested in using that temperature, and results will apply similarly to glazes at cones 04 and 10.

I also experimented with layering these glazes in multiple firings. The glazes have to be fired beginning at the highest temperature and ending at the lowest temperature. This is so the low fire glazes don't over melt when fired to mid range or high temperatures. First, I put the cone 10 glazes on the sculpture and fire the piece for the first time. Then I added cone 6 glazes to places that seem bare or boring on the piece and refire it. I continued doing this until I felt like the piece was interesting. Then I fired the piece to cone 04 with more glaze to finish the piece. The pieces end up at least

twice as heavy as they were when they came out of the bisque because of all the layered glaze.

Color has always been one of the most important parts of making art for me. My color palette is inspired by tropical towns, where the roofs and exterior walls are painted bright vibrant colors to counteract the heat from the sun. My goal with this project is to create a bright palette of colors in each type of glaze at the three temperatures I am testing. This proved harder than I thought, until I started adding equal amounts of zircopax and colorant to the lichen and gloop glazes. The lava glazes were the hardest to add color to because I realized very late into testing that the lava glazes did need titanium dioxide or zircopax and needed double the amount of colorant than I expected. I have mostly used mason stains because they are the easiest way to achieve the bright colors I am interested in.

Lichen glazes occur when a glaze separates into beads or square-like shapes, with areas of unglazed clay between them. Most lichen glazes contain magnesium carbonate, which is the main material I have been using to create a separating effect in the glaze. Magnesium carbonate is particularly difficult to work with, because it is such a light messy powder. These glazes accept color very well— I have recently been adding 6-10% mason stain to the glazes to create vibrant colors.

Application is also important in lichen glazes: when applied thickly dipped or poured, the glaze tends to crack as it dries. When the glaze holds less water, it also

cracks more quickly and in larger amounts. For example, the thicker lichen glazes I have made have the consistency of yogurt or a clay face mask, and flakes off easily. On the other hand, glazes with less water in them obviously crack less, but can still crack when they dry completely. These types of glazes are at a consistency where you can't hold it in your hand— if you dip your finger in it, you will be able to see most of the lines in your finger.

To combat the cracking problem, I have started adding an organic binding agent called CMC. If no CMC is available, I use my finger to rub the cracks in the glaze right after it dries. This slightly sands the surface and fills the cracks with glaze dust. Additionally, I've noticed the way the glaze is applied alters the way the glaze cracks. When the lichen glaze is applied thinly using a brush, the glaze tends to crack less and separates into more rectangle shaped beads. When dipped, the glaze forms more square or circular shapes.

Lichen glazes are my favorite. They look significantly different whether applied onto bare clay or onto another glaze. When applied on bare clay, you can run your hand on it and feel each separated bubble. When applied very thickly over another glaze, the texture can still be felt but much less obviously. When applied thinly over another glaze, the texture is gone, but the glaze still separates, creating spots of color over top of the other colored glaze making a leopard pattern.

Lava Glazes look like rough craters on the moon. They expand into a bubbly puffy texture as the glaze is fired, due to silicon carbide in the recipe. However, in most recipes, silicone carbide tints the glaze gray. However, using lithium carbonate to counteract the silicon carbide makes the glaze appear a little more white, but it also makes it difficult to add colorants to the glaze. I tried to use silicon carbide 1200 to see if that would take some of the greyness out of the glaze, but at least in the tests I did, it had the opposite effect. I have also tried to create lava glazes using bone ash, but have had no successful results. This was the most destructive glaze to test because it was wildly unpredictable and expanded enough to damage kiln shelves.

In my tests, if I add an average amount of stain, around 5-7%, the glaze swallows the color and makes it appear very pastel. Yet, if I add 11-13% colorant to the glaze, it appears as vibrant as other glazes. Lava glazes also have to be made very thick—the consistency should be thicker than yogurt, and sometimes even the same consistency as a clay. The glaze needs a certain thickness, because it gives enough room for it to expand into the bubbles and craters. I always apply it with handfuls, by pouring, or dipping the piece to make it thicker. Lava glazes also expand more if they are put on bare clay. Refiring lava glazes make it shrink and lose the volume it had after the first firing. After it is fired, lava glaze is rather fragile. Sometimes it has enough air between the craters that simply picking the piece up will squish it and crack it.

The last type of glaze I focused on is gloop glazes. I began to see these types of glazes all over social media and it interested me in how they were able to hold their

shape so well. I had a lot of trouble finding recipes for these glazes at first. I also mixed them to the consistency of yogurt the first few times I tried to create them. I mix them with minimal water now, and their consistency is closer to a clay body than glaze. I also added CMC to these glazes otherwise the glaze would fall off if I messed with it too much. Gloop glazes take color well if I add titanium dioxide or zircopax to an equal amount of stain. I apply gloop glazes two different ways. One is rolling the glaze into a ball or other shape and sticking it to a piece. The other is grabbing a handful of glaze and lathering it on the piece.

In conclusion, I learned so much about textured glazes during this project, especially with the help and ideas of Matt Kelleher. I was able to create a range of colors that fit the palette I wanted to make and learned about which materials go into making lichen, lava, and gloop glazes. I learned what certain materials do in a glaze: Magnesium carbonate creates lichen, silicon carbide creates craters and a grey toned color, CMC helps the glaze bond to the clay, titanium dioxide and zircopax help with opacity, etc. Though it was time consuming, I enjoyed experimenting with different materials and recipes throughout this project.

Textured and Color Glazes

Christine Raposas

Lichen, Lava, and Gloop Glazes



Lichen glaze crawls away and separates from itself into beads and sections



Lava glazes create matte, poofy craters



Gloop glazes are thick, clay like glazes that hold their shape.

Cone 04

Gloop Glaze

1 Thick White

Frit 3124 52

Silica 34

EPK 14

Bentonite 2



Added 7% dark red stain

Gloop Glaze

2 Boron Gloop with high silica and
alumina

C+C Ball CLay 44
Gerstley Borate 37
Silica 19



Gloop Glaze

3 Boron Gloop

C+C Ball Clay 42

Gerstley Borate 41

Silica 17



Gloop Glaze

4 Pcough low fire gloop

Frit 3134 40

Silica 40

EPK 20

Stain 2



Gloop Glaze 4 Variations



Added 8% orange stain



Added 8% turquoise stain



Added 7% violet stain

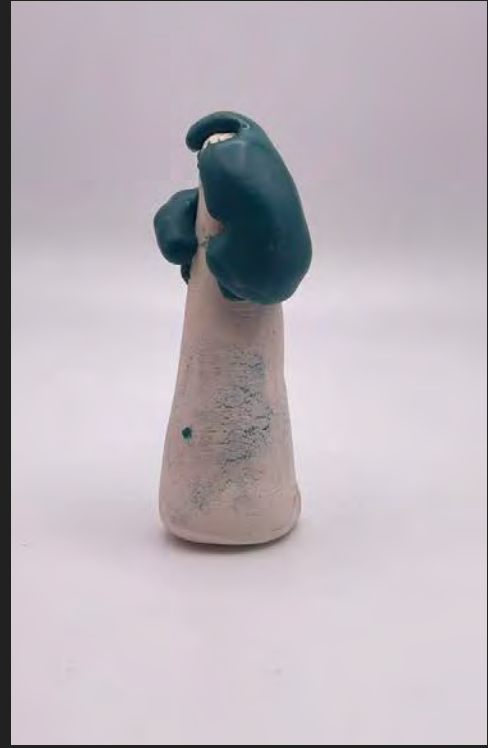
Gloop Glaze 4 Variations



Added 1% cobalt carbonate
and 2% manganese dioxide



Added 8% dark red stain



Added 7% peacock stain

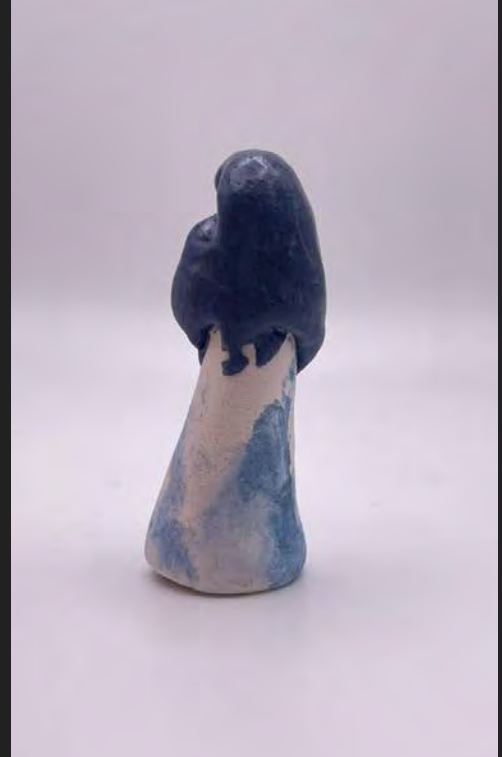
Gloop Glaze 4 Variations



Added 7% victoria green stain



Added 8% canary yellow stain



Added 1% cobalt carbonate

Gloop Glaze

5 Glorpus Lowfire

Custer Feldspar 29

Gerstley Borate 28

Silica 20

EPK 17

Bentonite 3

Whiting 3

Stain 8



Lava Glaze

1 Triple T Lava (Alfred Glaze Room)

Frit 3110 43.97

Silica 11.9

EPK 11.64

Whiting 10.48

Frit 3134 10.48

Titanium Dioxide 9.96

Silicon Carbide 1.57



Lava Glaze 1 Variations



Added 8% mango stain



Added 7% bermuda stain



Added 7% sky blue stain



Added 7% dark red stain

Lava Glaze 1 Variations



Added % lavender stain



Added 7% turquoise stain



Added 8% peach stain



Added 7% victoria
stain

Lava Glaze 1 Variations



Added 3% turquoise stain



Added 8% orange stain



Added 8% violet stain



Added 7% coral stain

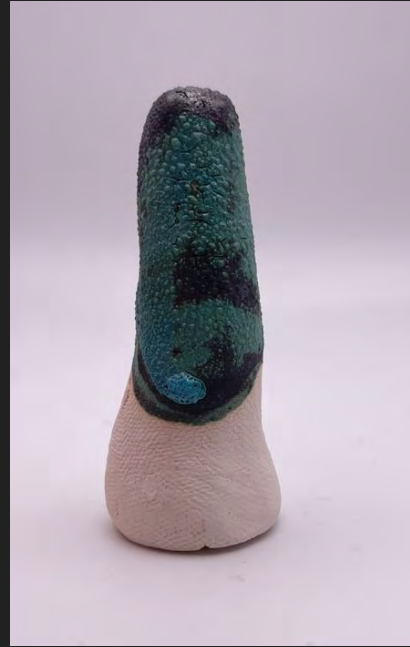
Lava Glaze 1 Variations



Added 3% cobalt carbonate stain



Added 7% celestine green stain



Added 5% tin and 5% turquoise stain

Lava Glaze 1 Variations



Added 8% tangerine
stain



Added 8% canary yellow
stain

Lava Glaze

17 Pinnell Strontium Base Cone 6
fired to Cone 04

Neph Sye 60
Strontium Carbonate 20
Kentucky OM4 10
Silica 9
Lithium Carbonate 1
Titanium Dioxide 5.5
Silicon Carbide 2.5



Lichen Glaze

1 Beads

Gerstley Borate 33.33

Magnesium Carbonate 33.33

Borax 26.67

Silica 6.67

Zircopax 6.67



Lichen Glaze

2A Lichen- Loose Skin Crawl

Frit 3195 20

Kaolin 30

Cryolite 50



Applied thickly



Applied thinly

Lichen Glaze

Bone Ash Lava Attempt 1:

Bone Ash 50

C+C Ball Clay 50



Added 3% CMC

Lichen Glaze

Bone Ash Attempt 2+ variants
MJ's Foam Glaze

Frit 3110 63.63
Wollastonite 9.09
Bone Ash 18.18
Frit 3124 4.54
EPK 4.54

Variation 1: + 7% tin
Variation 2: + 5% zircopax
Variation 3: 5% Titanium Dioxide
Variation 4: Swap EPK for OM4



Lichen Glaze Bone Ash Variations



Variation 1



Variation 2



Variation 3



Variation 4

Cone 6

Lichen Glaze

6 Lichen

Neph Sye 50

Magnesium Carbonate 40

Gerstley Borate 10



Lichen Glaze

9 Lichen Crawl

Magnesium Carbonate 31
Soda Feldspar (Kona F4) 30
Kaolin 19
Talc 8
Frit 3134 6
Zinc Oxide 6



Lichen Glaze

10 Lichen

Neph Sye 50

Mag Carb 40

Gerstley Borate 10



Lichen Glaze

11 Lichen John's Beads

Neph Sye 75

Mag Carb 20

OM4 Ball CLay 3

Zinc Oxide 2



Lichen Glaze 11



Added 3% violet stain



Added 6% violet stain



Added 10% violet stain



Added 13% violet stain

Lichen Glaze 11



Added 3% stain



Added 6% stain



Added 10% stain



Added 13% stain

Lichen Glaze

12 Danny's Crawling Glaze

Plastic Vitrox 10

Magnesium Carbonate 30

Frit 3124 15

Dolomite 5

Strontium Carbonate 10

Neph Sye 30

Zircopax 10



Lichen Glaze 12



Added 3% canary
yellow stain



Added 6% canary
yellow stain



Added 10% canary
yellow stain



Added 13% canary
yellow stain

Lichen Glaze 12



Added 3% stain



Added 6% stain



Added 10% stain



Added 13% stain

Lichen Glaze

13 Bead Glaze

Magnesium Carbonate 25
Neph Sye 70
Kentucky OM4 5



Lichen Glaze

14 Lichen

F-4 Feldspar 30

Kaolin 19

Magnesium Carbonate 31

Talc 8

Frit 3134 6



Lichen Glaze 14



Added 3% bermuda
stain



Added 6% bermuda
stain



Added 10% bermuda
stain



Added 13% bermuda
stain

Lichen Glaze 14



Added 3% turquoise
stain



Added 6% turquoise
stain



Added 10% turquoise
stain



Added 13% turquoise
stain

Lava Glaze

15 White Volcano

Custer Feldspar 50

Whiting 24

EPK 13

Silica 13

Titanium Dioxide 13

Silicon Carbide 1.2



Porcelain



Stoneware

Lava Glaze

16 Frosty White

Neph Sye 35

Silica 35

Dolomite 15

Ball Clay OM4 8

Whiting 4

Zinc Oxide 3

Tin Oxide 6



Lava Glaze

17 Pinnell Strontium Base

Neph Sye 60

Strontium Carbonate 20

Kentucky OM4 10

Silica 9

Lithium Carbonate 1

Titanium Dioxide 5.5

Silicon Carbide 2.5



17 Lava Variants



7% tangerine +
5% tin oxide



7% turquoise +
5% tin oxide

17 Lava Variants



Added 3%, 6%, 10%, 13% chartreuse stain

17 Lava Variants



Added 3%, 6%, 10%, 13% turquoise stain

Lava Glaze

1 Jans Barium Blue Matte Crater

Neph Sye 60

Barium Carbonate 20

Titanium Dioxide 10

Silica 10

Ball Clay OM4 8

Silicon Carbide 3

Lithium Carbonate 2

Bentonite 2



Porcelain



Stoneware

Lava Glaze 1 Variations



3 mg dark red stain



6 mg dark red stain



10 mg dark red stain



13 mg dark red stain

Lava Glaze 1 Variations



3 mg stain



6 mg stain



10 mg stain



13 mg stain

Lava Glaze

2 Volcanic Lava Glaze

Silica 32

Whiting 20

Custer Feldspar 33

Kaolin 15

Zinc Oxide 15

Silicon Carbide 20



Porcelain



Stoneware

Lava Glaze

3 Marilee's Lava Glaze

Whiting 24

Custer Feldspar 50

EPK 13

Silica 13

Titanium Dioxide 12

Silicon Carbide 3.5



Porcelain



Stoneware

Lava Glaze 3 Variations



3 mg turquoise stain



6 mg turquoise stain



10 mg turquoise stain



13 mg turquoise stain

Lava Glaze 3 Variations



3 mg dark red stain



6 mg dark red stain



10 mg dark red stain



13 mg dark red stain

Lava Glaze

4 Andrea Fizz Glaze

Magnesium Carbonate 25

Neph Sye 66

Ball Clay OM4 5

Silicon Carbide 4



Porcelain



Stoneware

Goop Glaze

G1 Derek Gooley Test Low Si + Al

Silica 37.48

Frit 3124 30.86

EPK 23.68

Whiting 7.98

Stain 4

Tin 4



Applied thick



Applied thin

Goop Glaze 1 Variations



7% mn Al pink +
7% tin oxide



7% turquoise +
7% tin oxide



7% violet + 7%
tin oxide

Goop Glaze

G2 Dereck Gooley Test High Si+ Al

Silica 45.74

EPK 28.23

Frit 3124 20.68

Whiting 5.35

Stain 4

CMC 1



Applied thick



Applied thin

Goop Glaze

G3 Gloop with B203 0.5 Test E2

EPK 33.36

Silica 32.4

Frit 3134 30.38

Whiting 3.38

Stain 5

Bentonite 2



Applied thick



Applied thin

Goop Glaze

G4 Gloop Biaxial w B203 0.5 Test C2

Silica 38.55

EPK 35.43

Frit 3134 23.63

Whiting 2.39

Stain 5

Bentonite 2



Applied thick



Applied thin

Goop Glaze

G5 Normal Hard Gloop

Silica 36.24

EPK 27.83

Minspar 18.98

Whiting 9.22

Frit 3134 7.73

Veegum T 2

Stain 2



Applied thick



Applied thin

Goop Glaze 5 Variations



3% CMC, Mixed thick



3% CMC, mixed thick



3% Veegum

Goop Glaze

G6 Normal Medium Gloop

Silica 33.82

EPK 25.82

Minspar 21.34

Frit 3134 8.61

Veegum T 2

Stain 2



Applied thick



Applied thin

Goop Glaze 6 Variations



+ 3% CMC, mixed
thick



+ 3% CMC

Goop Glaze

G7 Soft Gloop Glaze

Silica 31.4

EPK 24

Minspar 23.69

Whiting 11.41

Frit 3134 9.5

Veegum T 2

Stain 2



Applied thick



Applied thin

Goop Glaze 7 Variations



3% CMC



3% Veegum

Glaze Combinations- Dipped



A11
Turquoise Base Glaze +
12 Canary Lichen



A12
Turquoise Base Glaze +
7 Turquoise Lichen



A13
Dark Red Base +
11 White Lichen



A14
Dark Red Base +
1 Dark Red Lava

Glaze Combinations- Dipped



A15
Mn Al Base Glaze +
7 Turquoise Lichen



A16
Victorian Green Base +
1 Victoria Green Lava



A17
Sky Blue Base +
11 Violet Lichen



A18
Tangerine Base +
11 White Lichen

Glaze Combinations- Lichen Brushed On



B1
0.5 Turquoise/0.5 Bermuda Base
Glaze +
12 Canary Lichen



B2
Dark Red Base +
12 Canary Lichen



B3
Sky Blue Base +
11 White Lichen



B4
Canary Yellow Base +
11 Violet Lichen

Glaze Combinations- Brushed On



B5
Canary Yellow Base +
11 Violet Lichen



B6
0.5 Tangerine/0.5 Canary Base +
12 White Lichen



B7
0.5 Turquoise/0.5 Bermuda
Base + 11 Violet Lichen



B8
Dark Red Base +
11 White Lichen

Glaze Combinations- Brushed On



B9
Sky Blue Base +
7 Turquoise Lichen



B10
0.5 Tangerine/0.5 Canary Base +
7 Turquoise Lichen

Glaze Combinations



G9
G1 Gloop +
12 Canary Lichen



G10
0.5 Turquoise/0.5 Bermuda
Base + G7 Gloop



G12
Lilac Underglaze +
G3 Gloop



G14
0.5 Tangerine/0.5 Canary Ba
+ G5 Gloop

Glaze Combinations



G1 Canary Gloop +
7 Violet Lichen



G1 Canary Gloop +
11 mn Al Lichen



G1 Canary Gloop +
11 Violet Lichen

Glaze Combinations



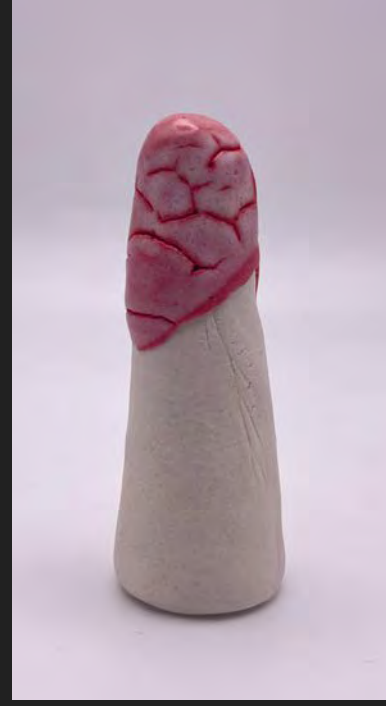
G1 Canary Gloop +
11 Dark Red Lichen



G1 Canary Gloop +
11 Turquoise Lichen



G1 Turquoise Gloop +
11 Violet Lichen



G2.2 Dark Red Gloop +
12 White Lichen

Cone 10

Lava

1 Burnt Marshmallow

Neph Sye 50.8

Zinc Oxide 25.2

EPK 20.57

Silica 3.43

Silicon Carbide 18

Chrome Oxide 1



Lava

17 Pinnell Strontium Base
fired to Cone 10

Neph Sye 60
Strontium Carbonate 20
Kentucky OM4 10
Silica 9
Lithium Carbonate 1
Titanium Dioxide 5.5
Silicon Carbide 2.5



Applied thick



Added 2% silicon carbide

Lava

1 Jans Barium Blue Matte Crater

Neph Sye 60

Barium Carbonate 20

Titanium Dioxide 10

Silica 10

Ball Clay OM4 8

Silicon Carbide 3

Lithium Carbonate 2

Bentonite 2



Added 7% Dark Red Stain

Lava

2 Volcanic Lava Glaze fired to Cone
10

Silica 32

Whiting 20

Custer Feldspar 33

Kaolin 15

Zinc Oxide 15

Silicon Carbide 20



Cone 6 recipe, melted significantly
more at cone 10

Lava

4 Andrea Fizz Glaze

Magnesium Carbonate 25

Neph Sye 66

Ball Clay OM4 5

Silicon Carbide 4



Applied thickly

Lichen

1 Katz Crawl

Neph Sye 53.59

EPK 21.7

Zinc Oxide 21.1

Silica 3.62



Applied thick



Applied thin

Goop

1 Bray Gloop

Neph Sye 45

Kona F-4 18.4

Kentucky OM4 16.4

Spodumene 15.2

Soda Ash 4

EPK 3

Silica 3



Mixed to Clay like
consistany

Glazes to my Pieces



