Glaze It Forward

by Diana Pancioli

WHY USE CONE 6 REDUCTION?

First of all Cone 6 saves money. Some say it costs less by almost a third compared to Cone 10. Secondly, it helps preserve the kiln; Cone 6 is much easier on kilns than Cone 10. Thirdly, less gas used means less carbon emissions produced and a greener planet for polar bears and humans. Lastly, a reduction atmosphere makes beautiful glazes, whatever the temperature.

The development of cone 6 Reduction glazes was originally an attempt to insure that our expensive new gas kiln would last a long time. It has. Extending its life was my major goal ten years ago; saving fuel and reducing emissions were secondary, until now.

Having fired cone 10 R for many years, I also thought that it might be fun to add something to the literature by developing reduction glazes for a lower temperature. After several years of firing a handful of glazes at 6R, I applied for a summer grant to develop a better palette. I tested hundreds of glazes—anything I could find that was written for mid-range. The 22 glazes chosen for Glaze Forward are the product of that summer's research. (Thank you Eastern Michigan University.)

My first goal was to lower the temperature of traditional Cone 10R glazes-- celadon, temmoku, iron saturate, shino, copper red, etc. I revised some favorite formulae to the new lower temperature. The remainder were selected from many tests; I hoped to provide a range of colors, surfaces, and bases that would satisfy many tastes and encourage experimentation by others.

I have provided a list of the sources of these glazes. You will recognize some of them from cone 10. I renamed all the glazes according to their surface qualities so that (a) they would not be mistaken for their cone 10 versions and (b) their names would give my students a clue about each glaze's color and appearance.

I sent some glazes to the Alfred Analytical Testing Laboratory for leach testing. The results are reported in the notes at the bottom of each glaze page. Some testing still needs to be done.

John Hesselberth has been generous in allowing me to use a version of his software "GlazeMaster" to present the glaze recipes, their photos, and their chemical analyses for you. (Thank you John.)

Diana Pancioli
Glaze Forward
January, 2009

Recipe Name Green Gloss

Cone 6 **Surface** Glossy **Color** True Green

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/1/2008 **Date Printed** 12/20/2008

Ingredients	% or Amt.
Cornwall Stone	38.0
Whiting	14.0
Feldspar--Custer	11.0
Feldspar--Kona F4	10.0
Barium Carbonate	11.0
Dolomite	3.0
Ball Clay--Old Mine #4	5.0
Silica	8.0
Totals	100.0

Add

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.125	2.75	3.01
K_2O	0.102	3.43	2.47
MgO	0.053	0.76	1.29
CaO	0.544	10.85	13.14
SrO			
BaO	0.176	9.63	4.26
ZnO			
PbO			
Subtotal Alkalis	0.227	6.17	5.48
Total Fluxes	1.000	27.42	24.16
Al_2O_3	0.351	12.74	8.49
B_2O_3			
Fe_2O_3	0.003	0.18	0.08
SiO_2	2.776	59.34	67.08
TiO_2	0.003	0.10	0.08
P_2O_5	0.004	0.21	0.10
Si:Al	7.90		
Exp Coeff	79.82		
L.O.I.	11.28		

Glaze Photo

Recipe Cost, $ / lb 0.91

Comments

Derived from Cone 10 “Dimig Green”

This beautiful glossy green stays green unless the reduction is too heavy. Sometimes a pink blush will highlight one side of the piece. This glaze crazes. (Probably more flint will fix it). It is a stronger green with 5% copper but also leaches more. Becasue of the high copper content and the barium it is not useful as a liner. Strontium substitution for the barium doesn’t work. It helps fix the crazing but the color changes to a muddy pink.
At 4% copper carbonate it leached 23.2 mg/l copper
At 5% it leached 43.1 mg/l copper and 14.2 barium. Thin to medium application

Recipe Name Denim Blue

Cone 6 **Surface** Semiglossy **Color** medium blue

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/2/2008 **Date Printed** 12/20/2008

Ingredients	% or Amt.
Feldspar--Custer	40.0
Whiting	16.0
Talc	9.0
Frit--Ferro 3134	9.0
Kaolin--EPK	10.0
Silica	16.0
Totals	100.0

Add

Cobalt Carbonate	1.2
Copper Carbonate	1.2
Titanium Dioxide	2.0
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.099	2.39	2.43
K_2O	0.123	4.48	3.00
MgO	0.194	3.03	4.73
CaO	0.584	12.68	14.23
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.222	6.87	5.42
Total Fluxes	1.000	22.58	24.38
Al_2O_3	0.297	11.72	7.24
B_2O_3	0.085	2.29	2.07
Fe_2O_3	0.003	0.19	0.07
SiO_2	2.715	63.16	66.20
TiO_2	0.001	0.03	0.03
P_2O_5	0.000	0.01	0.01
Si:Al	9.15		
Exp Coeff	74.11		
L.O.I.	9.17		

Glaze Photo

Recipe Cost, $ / lb 0.90

Comments

This is a Val Cushing glaze; the master has done it again. This glaze is probably stable enough to pass a leach test, which means you can use it at these colorant levels on the interiors of vessels for food use.

Leach test results not yet completed.

Thin to medium application

Recipe Name Cold Yellow

Cone 6 **Surface** Semiglossy **Color** yellow

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/1/2008 **Date Printed** 12/20/2008

Ingredients	% or Amt.
Feldspar--Kona F4	34.0
Barium Carbonate	20.0
Dolomite	16.0
Frit--Ferro 3110	10.0
Kaolin--EPK	8.0
Silica	12.0
Totals	100.0

Add

Bentonite	2.0
Zircopax	10.0
Iron Oxide--Red	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.166	4.47	5.06
K_2O	0.053	2.19	1.63
MgO	0.219	3.83	6.66
CaO	0.294	7.18	8.98
SrO			
BaO	0.267	17.85	8.15
ZnO			
PbO			
Subtotal Alkalis	0.220	6.66	6.69
Total Fluxes	1.000	35.52	30.49
Al_2O_3	0.263	11.65	8.01
B_2O_3	0.010	0.30	0.30
Fe_2O_3	0.002	0.16	0.07
SiO_2	2.004	52.31	61.09
TiO_2	0.001	0.03	0.02
P_2O_5	0.000	0.01	0.01
Si:Al	7.62		
Exp Coeff	85.18		
L.O.I.	12.99		

Glaze Photo

Recipe Cost, $ / lb 0.98

Comments

Derived from Cone 10 “Alfred Yellow”

This cold yellow glaze goes to pale blue where thick and warm brown where thin. Strontium does not work as a substitute for barium in this glaze. The yellow color is completely lost with strontium.

This is not a liner glaze. It leaches barium at 7.25 mg/l.

Thin to medium application.

Recipe Name Dark Satin

Cone 6 **Surface** Semiglossy **Color** teal, green, black

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/20/2008

Ingredients	% or Amt.
Feldspar--Kona F4	48.0
Whiting	16.0
Frit--Ferro 3134	6.0
Ball Clay--Old Mine #4	12.0
Kaolin--EPK	7.0
Flint	11.0
Totals	100.0

Add

Iron Oxide--Red	5.0
Cobalt Carbonate	3.0
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.219	4.41	4.63
K_2O	0.089	2.73	1.88
MgO	0.008	0.11	0.17
CaO	0.684	12.47	14.45
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.308	7.14	6.51
Total Fluxes	1.000	19.71	21.14
Al_2O_3	0.516	17.09	10.90
B_2O_3	0.068	1.54	1.44
Fe_2O_3	0.005	0.24	0.10
SiO_2	3.135	61.22	66.27
TiO_2	0.007	0.18	0.15
P_2O_5	0.000	0.01	0.00
Si:Al	6.08		
Exp Coeff	77.82		
L.O.I.	10.06		

Glaze Photo

Recipe Cost, $ / lb 1.00

Comments

Derived from E. Cooper's "Matt Iron"

A textured satin with variegated color. The attractive teal/green/black color mix will change to a smooth satin black with more dark colorants but may also then be in danger of leaching. A dark glaze should contain no more than 2 to 3 percent cobalt if it is to be used as a liner. This glaze is more colorful on an iron-bearing clay body.

At 6% cobalt (twice as much as the recipe calls for) it leached 0.1 mg/l of cobalt.

Thin to medium application.

Recipe Name Satin Celadon

Cone 6 **Surface** Semiglossy **Color** Celery

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/2/2008 **Date Printed** 12/20/2008

Ingredients	% or Amt.
Nepheline Syenite	34.0
Whiting	20.0
Talc	5.0
Frit--Ferro 3110	2.0
Ball Clay--Old Mine #4	19.0
Silica	20.0
Totals	100.0

Add

Iron Oxide--Red	1.5
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.181	4.21	4.31
K_2O	0.058	2.04	1.38
MgO	0.124	1.88	2.97
CaO	0.638	13.44	15.24
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.238	6.25	5.69
Total Fluxes	1.000	21.57	23.89
Al_2O_3	0.394	15.12	9.43
B_2O_3	0.002	0.06	0.05
Fe_2O_3	0.005	0.31	0.12
SiO_2	2.775	62.66	66.30
TiO_2	0.009	0.26	0.21
P_2O_5			
Si:Al	7.03		
Exp Coeff	75.65		
L.O.I.	11.77		

Glaze Photo

Recipe Cost, $ / lb 0.26

Comments

Derived from E. Cooper's "Clear Pale Olive"

A lovely satin celadon (more celery colored, not blue). The addition of more silica will make it shinier and move toward correcting the crazing (which is only visible if you stain it). But I don't like the glaze as well with the silica addition. I added a little frit to give it a slight sheen.

This glaze settled out more than the others despite the addition of bentonite so I added a small amount of Epsom salts to keep it in suspension

Not as nice on porcelain.

Recipe Name Textured Blue

Cone 6 **Surface** Semiglossy **Color** Curdled blues

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/2/2008 **Date Printed** 12/20/2008

Ingredients	% or Amt.
Nepheline Syenite	30.0
Frit--Ferro 3134	20.0
Talc	17.0
Whiting	10.0
Kaolin--EPK	13.0
Silica	10.0
Totals	100.0

Add

Zircopax	10.0
Rutile	3.0
Cobalt Carbonate	0.5
Copper Carbonate	1.0
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.192	5.47	5.48
K_2O	0.036	1.55	1.02
MgO	0.302	5.59	8.61
CaO	0.470	12.09	13.39
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.228	7.02	6.50
Total Fluxes	1.000	24.70	28.50
Al_2O_3	0.276	12.89	7.85
B_2O_3	0.156	4.99	4.45
Fe_2O_3	0.002	0.17	0.06
SiO_2	2.074	57.15	59.09
TiO_2	0.001	0.04	0.03
P_2O_5	0.000	0.02	0.01
Si:Al	7.53		
Exp Coeff	75.59		
L.O.I.	7.47		

Glaze Photo

Recipe Cost, $ / lb 0.88

Comments

This is Marcia Selsor's Waxy White base with a number of colorants added. This variation is derived from a 50/50 color blend with rutile incorporated in the base for texture. There are other nice combinations with rutile but this one remains a favorite. Gloes glossy on interiors and breaks beautifully over textures.

Medium application.

Recipe Name Chun or Jun

Cone 6 **Surface** Semiglossy **Color** Bright textured white

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

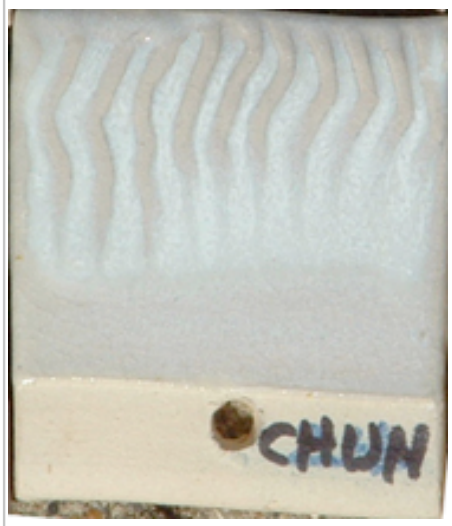
Date Created 5/2/2008 **Date Printed** 12/20/2008

Ingredients	% or Amt.
Feldspar--Kona F4	34.0
Whiting	10.0
Dolomite	6.0
Zinc Oxide	3.0
Frit--Ferro 3134	17.0
Silica	30.0
Totals	100.0

Add

Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.186	4.42	4.45
K_2O	0.049	1.76	1.17
MgO	0.089	1.37	2.12
CaO	0.572	12.28	13.65
SrO			
BaO			
ZnO	0.104	3.23	2.48
PbO			
Subtotal Alkalis	0.235	6.19	5.62
Total Fluxes	1.000	23.07	23.87
Al_2O_3	0.186	7.26	4.44
B_2O_3	0.159	4.23	3.79
Fe_2O_3	0.001	0.07	0.03
SiO_2	2.843	65.36	67.87
TiO_2			
P_2O_5			
Si:Al	15.28		
Exp Coeff	73.37		
L.O.I.	7.23		



Glaze Photo

Recipe Cost, $ / lb 0.59

Comments

MarciaSelsor's "Jun", unchanged.

This is a beautiful bright marshmellow-like white textured semi-gloss. I tried adjusting this formula but it didn't come out as well as the original. (You might want to try to take out the zinc.) The difficulty is that to make this glaze more stable one has to destroy an important quality--its ability to run and hold itself in beautiful fat drips. (Don't use near the foot.)

I accept that it might not last as long with the dishwasher use (although after 3 years of use I can't see any changes). Application depends on where you want the glaze to form drips. (It is good lightly tinted too, with small amounts of iron or nickel.)

Recipe Name Transparent Gloss

Cone 6 **Surface** Glossy **Color** Grey

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Frit--Ferro 3195	29.0
Wollastonite	29.0
Magnesium Carbonate	4.0
Kaolin--EPK	19.0
Flint	19.0
Totals	100.0

Add

Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.081	2.01	2.02
K_2O	0.002	0.08	0.05
MgO	0.158	2.55	3.94
CaO	0.759	16.99	18.90
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.083	2.09	2.07
Total Fluxes	1.000	21.63	24.91
Al_2O_3	0.290	11.81	7.23
B_2O_3	0.261	7.25	6.50
Fe_2O_3	0.004	0.25	0.10
SiO_2	2.457	58.95	61.21
TiO_2	0.002	0.06	0.05
P_2O_5	0.000	0.02	0.01
Si:Al	8.47		
Exp Coeff	64.56		
L.O.I.	6.04		

Glaze Photo

Recipe Cost, $ / lb 0.78

Comments

An adjustment of Pete Pinnell's "1214"

This transparent fits quite well on the clay body I used, which shrinks 13%. This glaze may be used as a liner. A small addition of iron will convert it to a grey/green celadon.

Thin application.

Recipe Name Temmoku--C6R

Cone 6 **Surface** Glossy **Color** Black/Red

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Feldspar--Custer	58.0
Whiting	18.0
Ball Clay--Old Mine #4	12.0
Silica	12.0
Totals	100.0

Add

Iron Oxide--Red	13.0
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.105	1.98	2.08
K_2O	0.230	6.61	4.57
MgO	0.008	0.10	0.17
CaO	0.657	11.21	13.03
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.335	8.58	6.65
Total Fluxes	1.000	19.90	19.85
Al_2O_3	0.474	14.72	9.41
B_2O_3			
Fe_2O_3	0.006	0.27	0.11
SiO_2	3.551	64.95	70.49
TiO_2	0.007	0.16	0.13
P_2O_5			
Si:Al	7.49		
Exp Coeff	78.72		
L.O.I.	9.67		

Glaze Photo

Recipe Cost, $ / lb 0.49

Comments

An adjustment of Hamer's "Temmoku"

This cone 6 Temmoku has 13% iron, a lot more than a Temmoku at Cone 10. At cone 6 reduction Temmokus seem to need more than the usual 8% required at Cone 10 to give the same black/red color break. At 11% iron this formula makes a handsome orange glaze with darker brown coloration in the depths.

Thin to medium application

Recipe Name Speckle

Cone 6 **Surface** Semimatte **Color** white with speckles

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Nepheline Syenite	34.0
Whiting	29.0
Cornwall Stone	15.0
Frit--Ferro 3134	5.0
Kaolin--EPK	14.0
Flint	3.0
Totals	100.0

Add

Zircopax	10.0
Ilmenite--granular	3.0
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.173	5.21	5.46
K_2O	0.056	2.57	1.77
MgO	0.007	0.15	0.23
CaO	0.764	20.85	24.15
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.229	7.78	7.23
Total Fluxes	1.000	28.78	31.61
Al_2O_3	0.371	18.40	11.72
B_2O_3	0.040	1.37	1.27
Fe_2O_3	0.003	0.20	0.08
SiO_2	1.747	51.07	55.22
TiO_2	0.002	0.06	0.05
P_2O_5	0.002	0.11	0.05
Si:Al	4.71		
Exp Coeff	89.80		
L.O.I.	15.46		

Glaze Photo

Recipe Cost, $ / lb 0.59

Comments

Derived for E. cooper's "Cream Matt Speckle"

A smooth off-white semi-matte with orangy speckles.
The matte is not useful as a liner.

Apply thin to medium.

Recipe Name Shino

Cone 6 **Surface** Semiglossy **Color** white/red

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Nepheline Syenite	40.0
Spodumene--Foote	30.0
Soda Ash	8.0
Ball Clay--Old Mine #4	17.0
Kaolin--EPK	5.0
Totals	100.0

Add

Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O	0.247	1.86	4.19
Na_2O	0.607	9.45	10.28
K_2O	0.108	2.55	1.83
MgO	0.012	0.12	0.20
CaO	0.026	0.36	0.43
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.962	13.86	16.29
Total Fluxes	1.000	14.34	16.93
Al_2O_3	0.977	25.01	16.54
B_2O_3			
Fe_2O_3	0.025	1.00	0.42
SiO_2	3.893	58.70	65.91
TiO_2	0.012	0.23	0.20
P_2O_5	0.000	0.01	0.00
Si:Al	3.98		
Exp Coeff	84.73		
L.O.I.	6.54		

Glaze Photo

Recipe Cost, $ / lb 0.14

Comments

Derived from a cone 10 glaze “Porcelain Shino”

Shinos are temperamental. This one needs strong reduction and is more effective on a dark iron body. It is rather bland on white stoneware. It is capable of carbon trapping. It also crazes. This glaze does not work well thickly applied.

Application should be thin to medium.

Recipe Name Satin White--C6R

Cone 6 **Surface** Semiglossy **Color** white

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Feldspar--Kona F4	38.0
Whiting	20.0
Talc	5.0
Frit--Ferro 3134	8.0
Kaolin--EPK	18.0
Flint	11.0
Totals	100.0

Add

Zircopax	8.0
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.153	3.95	4.07
K_2O	0.055	2.16	1.46
MgO	0.107	1.79	2.84
CaO	0.685	16.00	18.22
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.208	6.11	5.54
Total Fluxes	1.000	23.90	26.60
Al_2O_3	0.381	16.17	10.14
B_2O_3	0.073	2.10	1.93
Fe_2O_3	0.003	0.19	0.08
SiO_2	2.301	57.54	61.20
TiO_2	0.002	0.06	0.05
P_2O_5	0.000	0.02	0.01
Si:Al	6.04		
Exp Coeff	77.89		
L.O.I.	12.19		

Glaze Photo

Recipe Cost, $ / lb 0.47

Comments

Derived from E. Cooper's "Cool Matt Blue"

This is a cool white satin. If you want it more matte, remove 2% frit. If you want it a little shinier, add 2% frit. Can be used as a liner glaze.

Thin to medium application

Recipe Name Pale Blue Matte

Cone 6 **Surface** Matte **Color** Pale turquoise

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Feldspar--Custer	55.0
Whiting	24.0
Kaolin--EPK	14.0
Flint	7.0
Totals	100.0

Add

Zircopax	10.0
Cobalt Carbonate	0.5
Copper Carbonate	3.0
Rutile	6.0
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.081	1.92	2.03
K_2O	0.180	6.44	4.48
MgO	0.006	0.09	0.14
CaO	0.733	15.66	18.30
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.261	8.36	6.51
Total Fluxes	1.000	24.11	24.95
Al_2O_3	0.435	16.87	10.84
B_2O_3			
Fe_2O_3	0.004	0.23	0.10
SiO_2	2.567	58.72	64.06
TiO_2	0.002	0.05	0.04
P_2O_5	0.000	0.02	0.01
Si:Al	5.91		
Exp Coeff	83.49		
L.O.I.	13.07		

Glaze Photo

Recipe Cost, $ / lb 0.83

Comments

Derived from Rick Malgrem “Bronze/Green Matte”

A light blue which breaks to a darker grey in deep places. Too matte to be used as a liner.

Thin to medium application.

Recipe Name Ochre/Red

Cone 6 **Surface** Semimatte **Color** Ochre breaking to red

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Feldspar--Custer	40.0
Whiting	21.0
Dolomite	13.0
Bone Ash	6.0
Kaolin--EPK	15.0
Flint	4.0
Totals	99.0

Add

Superpax	5.0
Iron Oxide--Red	8.0
Bentonite	3.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.042	1.53	1.59
K_2O	0.092	5.07	3.47
MgO	0.148	3.49	5.59
CaO	0.718	23.56	27.10
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.134	6.60	5.07
Total Fluxes	1.000	33.65	37.75
Al_2O_3	0.259	15.47	9.79
B_2O_3			
Fe_2O_3	0.003	0.29	0.12
SiO_2	1.347	47.35	50.86
TiO_2	0.001	0.06	0.04
P_2O_5	0.038	3.16	1.44
Si:Al	5.19		
Exp Coeff	85.25		
L.O.I.	17.92		

Glaze Photo

Recipe Cost, $ / lb 0.60

Comments

Derived from Hayden “Cinnamon Red”

This glaze, as indicated by its name, gives a nice color shift from ochre to iron red. It is low in silica so it is not a candidate for a liner glaze for food use.

Thin to medium application.

Recipe Name Iron Red

Cone 6 **Surface** Semimatte **Color** Rusty red with flecks

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/1/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Nepheline Syenite	49.0
Bone Ash	11.0
Whiting	8.0
Talc	7.0
Kaolin--EPK	6.0
Silica	19.0
Totals	100.0

Add

Iron Oxide--Red	16.0
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.218	5.14	5.41
K_2O	0.068	2.44	1.69
MgO	0.158	2.43	3.92
CaO	0.557	11.89	13.84
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.286	7.58	7.10
Total Fluxes	1.000	21.90	24.86
Al_2O_3	0.374	14.53	9.30
B_2O_3			
Fe_2O_3	0.002	0.11	0.05
SiO_2	2.555	58.47	63.51
TiO_2	0.001	0.02	0.02
P_2O_5	0.091	4.94	2.27
Si:Al	6.83		
Exp Coeff	75.98		
L.O.I.	5.28		

Glaze Photo

Recipe Cost, $ / lb 0.44

Comments

Derived from Cone 10 “Oharata Red”

This iron red satin glaze is low in silica so probably it is not good for use as a liner for food containers. but it has an interesting ability to form smallsparkly crystals spaced out in the glaze. The addition of 10% flint will make it a shiny two toned iron saturate and will make it useful as a liner.

Thin to medium application.

Recipe Name Fake Ash

Cone 6 **Surface** Typical Ash Rivulets **Color** Beige, yellow, red, green

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/2/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Dolomite	25.0
Strontium Carbonate	9.0
Bone Ash	5.0
Lithium Carbonate	2.0
Frit--Ferro 3134	10.0
Ball Clay--Old Mine #4	24.0
Red Art	23.0
Silica	2.0
Totals	100.0

Add

Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O	0.055	0.99	2.16
Na_2O	0.039	1.44	1.51
K_2O	0.026	1.50	1.03
MgO	0.290	7.08	11.40
CaO	0.464	15.74	18.23
SrO	0.125	7.85	4.92
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.120	3.94	4.70
Total Fluxes	1.000	34.61	39.25
Al_2O_3	0.214	13.21	8.41
B_2O_3	0.068	2.87	2.67
Fe_2O_3	0.026	2.46	1.00
SiO_2	1.195	43.40	46.92
TiO_2	0.014	0.66	0.54
P_2O_5	0.031	2.64	1.21
Si:Al	5.58		
Exp Coeff	75.01		
L.O.I.	19.47		

Glaze Photo

Recipe Cost, $ / lb 0.79

Comments

An adjustment of “Andie’s Fake Ash”

This is a beautifully variegated fake ash glaze. It is a brighter yellow on porcelain with hints of green where thicker and terra cotta colored where thin. it is not stable because it is low in silica but to alter it would change the ash effect. While it might not meet strict requirements of stability, I use it anyway (having substituted strontium for barium). It is lovely on plates and bowls. If you wish to be more careful in your use of it you could put it instead on vases, spoon jars, dry storage jars, and other non wet food items. It is more beautiful with strontium as a substitute (one of the few I tested that is).

When made with barium it leached 3.28 mg/l

Recipe Name Dark Blue

Cone 6 **Surface** Glossy **Color** True dark blue

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/1/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Feldspar--Kona F4	41.0
Whiting	19.0
Frit--Ferro 3110	5.0
Kaolin--EPK	10.0
Silica	25.0
Totals	100.0

Add

Cobalt Carbonate	2.0
Iron Oxide--Red	1.5
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.202	4.00	4.10
K_2O	0.079	2.36	1.59
MgO	0.005	0.07	0.10
CaO	0.714	12.77	14.49
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.281	6.35	5.70
Total Fluxes	1.000	19.19	20.29
Al_2O_3	0.410	13.32	8.32
B_2O_3	0.007	0.14	0.13
Fe_2O_3	0.003	0.13	0.05
SiO_2	3.507	67.16	71.17
TiO_2	0.001	0.03	0.03
P_2O_5	0.000	0.01	0.01
Si:Al	8.56		
Exp Coeff	74.34		
L.O.I.	9.97		

Glaze Photo

Recipe Cost, $ / lb 0.79

Comments

Source: A mystery

This is a glossy dark blue. The addition of a small amount of iron keeps the blue from moving toward violet. It may be used as a liner glaze if the cobalt is kept at or under 2 percent. Brighter on porcelain.

No cobalt leaching was detected with 2% CoCO3 in the formula.

Thin to medium application

Recipe Name Copper Red

Cone 6 **Surface** Semiglossy **Color** Mottled red

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/2/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Feldspar--Custer	74.0
Whiting	11.0
Frit--Ferro 3124	10.0
Silica	5.0
Totals	100.0

Add

Copper Carbonate	2.0
Tin Oxide	2.0
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.175	3.02	3.20
K_2O	0.303	7.93	5.53
MgO	0.003	0.03	0.05
CaO	0.520	8.11	9.50
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.478	10.95	8.73
Total Fluxes	1.000	19.09	18.28
Al_2O_3	0.508	14.41	9.29
B_2O_3	0.075	1.44	1.36
Fe_2O_3	0.003	0.13	0.05
SiO_2	3.886	64.93	71.02
TiO_2			
P_2O_5			
Si:Al	7.65		
Exp Coeff	82.36		
L.O.I.	5.10		

Glaze Photo

Recipe Cost, $ / lb 0.89

Comments

An adjustment of Pete Pinnell's "Cranberry"

This is a dependable bright copper red. It sometimes gives an attractive mottled surface.

It is not suitable as a liner glaze.

It leaches 12.2 mg/l copper

Thin to medium application.

Recipe Name Chocolate

Cone 6 **Surface** Semiglossy **Color** Brown variations

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Red Art	68.0
Zinc Oxide	18.0
Whiting	10.0
Frit--Ferro 3110	4.0
Totals	100.0

Add

Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.028	0.74	0.83
K_2O	0.077	3.10	2.30
MgO	0.068	1.17	2.03
CaO	0.267	6.42	7.99
SrO			
BaO			
ZnO	0.560	19.52	16.75
PbO			
Subtotal Alkalis	0.105	3.84	3.13
Total Fluxes	1.000	30.94	29.89
Al_2O_3	0.281	12.26	8.40
B_2O_3	0.004	0.11	0.11
Fe_2O_3	0.076	5.20	2.27
SiO_2	1.962	50.44	58.64
TiO_2	0.023	0.78	0.68
P_2O_5			
Si:Al	6.98		
Exp Coeff	74.31		
L.O.I.	7.78		

Glaze Photo

Recipe Cost, $ / lb 0.73

Comments

Derived from E. Cooper's "Brown Matte"

Although zinc is supposed to disappear in reduction, this glaze doesn't work without it. Chocolate looks like a slip glaze similar to old Albany slip glazes. I woul try using it under trailing, brush work, etc. The color varies subtly depending on where the flame touches it.

Thin the medium application

Recipe Name Blue/Green Gloss

Cone 6 **Surface** Glossy **Color** blue/green/brown

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Nepheline Syenite	27.0
Frit--Ferro 3134	27.0
Frit--Ferro 3110	20.0
Ball Clay--Old Mine #4	13.0
Flint	13.0
Totals	100.0

Add

Cobalt Carbonate	1.3
Iron Oxide--Red	2.0
Titanium Dioxide	6.7
Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.476	8.72	8.98
K_2O	0.067	1.87	1.27
MgO	0.007	0.08	0.13
CaO	0.450	7.47	8.51
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.543	10.59	10.25
Total Fluxes	1.000	18.14	18.89
Al_2O_3	0.362	10.90	6.83
B_2O_3	0.335	6.91	6.34
Fe_2O_3	0.004	0.17	0.07
SiO_2	3.587	63.71	67.75
TiO_2	0.007	0.16	0.13
P_2O_5			
Si:Al	9.92		
Exp Coeff	82.77		
L.O.I.	2.22		

Glaze Photo

Recipe Cost, $ / lb 1.56

Comments

Derived from E. Cooper's "Medium Blue".

This glaze has nice color shifts from light blue to medium green where thicker, to dark brown where thin. May be stable. I added a small amount of Epsom salts to keep it in good suspension because the large quantity of frit in this glaze can cause it to settle badly, despite the addition of bentonite.

Thin to medium application.

Recipe Name Ash Brown

Cone 6 **Surface** Matte **Color** Medium brown

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Red Art	50.0
Whiting	19.0
Barium Carbonate	11.0
Ball Clay--Old Mine #4	10.0
Flint	10.0
Totals	100.0

Add

Bentonite	2.0

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.004	0.09	0.11
K_2O	0.077	2.51	1.86
MgO	0.072	1.01	1.76
CaO	0.658	12.83	15.97
SrO			
BaO	0.188	10.04	4.57
ZnO			
PbO			
Subtotal Alkalis	0.081	2.60	1.97
Total Fluxes	1.000	26.48	24.26
Al_2O_3	0.365	12.92	8.85
B_2O_3			
Fe_2O_3	0.077	4.29	1.88
SiO_2	2.653	55.34	64.34
TiO_2	0.028	0.76	0.67
P_2O_5			
Si:Al	7.27		
Exp Coeff	74.83		
L.O.I.	14.90		

Glaze Photo

Recipe Cost, $ / lb 0.41

Comments

Derived from E. Cooper's "Broken Yellow Brown"

The substitution of strontium in this glaze was less than successful. The original glaze has a surface complexity which was lost with the substitution.

This is not a liner glaze.

Thin to medium application

Leach test results not vet in.

Recipe Name Amber--C6R

Cone 6 **Surface** Glossy **Color** Amber

Firing Reduction **Recipe Set** Pancioli ^6 Reduction

Test Sample IDs

Date Created 5/3/2008 **Date Printed** 12/19/2008

Ingredients	% or Amt.
Red Art	39.0
Nepheline Syenite	18.0
Whiting	15.0
Wollastonite	9.0
Dolomite	2.0
Frit--Ferro 3134	4.0
Kaolin--EPK	3.0
Flint	10.0
Totals	100.0

Add

	Unity	Weight %	Mole %
Li_2O			
Na_2O	0.106	2.51	2.61
K_2O	0.075	2.71	1.86
MgO	0.088	1.36	2.18
CaO	0.731	15.65	18.06
SrO			
BaO			
ZnO			
PbO			
Subtotal Alkalis	0.181	5.22	4.48
Total Fluxes	1.000	22.23	24.71
Al_2O_3	0.341	13.29	8.43
B_2O_3	0.039	1.03	0.96
Fe_2O_3	0.052	3.17	1.28
SiO_2	2.599	59.64	64.23
TiO_2	0.015	0.47	0.38
P_2O_5	0.000	0.00	0.00
Si:Al	7.61		
Exp Coeff	76.41		
L.O.I.	10.53		

Glaze Photo

Recipe Cost, $ / lb 0.29

Comments

Derived from cone 10 “Amber Celadon”

I tested a number of variations of this recipe; I hope to simplify it, but the resulting changes produced a much less interesting glaze. You could try adding a percent of iron if you want it a little darker.

Thin to medium application.