Adventurine Glazes - Cone 04

Easy Aventurine Glazes

by Robert and Beatrice Pearson

Aventurine glazes are recipes containing (after firing) sparkling, minute crystals of metal oxides. But unlike the large, dramatic, zinc silicate crystals of typical crystalline glazes, no special firing schedule is necessary to produce an aventurine glaze, nor do the metal oxide crystals of aventurine glazes become very large, so temperature holding (which allows crystals time to grow) during firing is not required. The aventurine glazes described in this article are all based on iron oxide and formulated to mature at Cone 04. A junior Cone 03 was used in a kiln sitter to terminate the firing cycle near this point.

Glaze 1 is a simple recipe which will serve to demonstrate some of the problems that had to be solved in developing workable recipes:

Glaze 1
(Cone 04–03)

Borax	34.8%
Red Iron Oxide	12.8
Kingman Feldspar	52.4
	100.0%

Our first bag of borax varied greatly in particle size, and it was almost impossible to use in a brush-on glaze. When the recipe was mixed using powdered borax and thinned to brushing consistency, it quickly warmed, then set into a solid mass. Had we discovered a new cement? Only the prompt addition of more water with rapid stirring would keep the glaze in a usable condition. Even then, there was a great increase in particle size, making it difficult to apply with a brush.

We gradually realized that the borax was partially dehydrated. With water added, it quickly rehydrated, forming large, hard, intergrown crystals of true borax. Testing showed that the material we had started with had only about half the amount of water contained in true borax. Its molecular weight was 291, instead of the 381 expected.

A simple, but slow, method was developed to rehydrate the borax. Plastic tubs were filled with the partially dehydrated powder, and an open, wide-mouthed bottle filled with water was placed in each tub. The tubs were then enclosed with plastic bags; a stick placed in each tub kept the plastic bag from resting on the open mouth of the bottle. Water vapor slowly rehydrated the powdered borax, without forming many of the large, hard crystals encountered previously. A sample of the original borax continued to gain moisture for three weeks. The final weight gain was approximately 30%!

The second, and most surprising, problem arose when this glaze was fired in various kilns. Originally, it was fired in a Paragon electric kiln (model B77B) with slightly under 2-cubic-foot capacity. When the same glaze was fired in a 6-cubic-foot Paragon electric (model K6H), it had an entirely different appearance. Instead of iron oxide crystals embedded in the glaze, part of the iron oxide formed a less attractive metallic surface scum. Composition changes were made until the same ingredients gave satisfactory results in the larger, slower cooling kiln:

Slow Cool Glaze 1
(Cone 04–03)

Borax	34%
Red Iron Oxide	12
Kingman Feldspar	54
	100%

In most cases, we found that less iron was required by a glaze fired in a large kiln. Evidently, the longer cooling cycle in the larger kiln gives more time for crystals to form. Rather than altering the firing cycle, we used compositional changes to adjust crystal growth. Local temperature variation within a kiln, however, can sometimes cause detectable glaze variation. For optimum results, cluster aventurine-glazed ware near the center of the kiln; or if that is not feasible, keep a record of ware placement in the kiln so that preferred locations can be identified.

In strong sunlight, this sample of an aventurine glaze sparkles with gold flecks—minute crystals reflecting light from their faceted, mirrorlike surfaces.

Aventurine glazes usually look better if there is some flow during firing. All of the following recipes (developed for the 2-cubic-foot kiln, then adapted for the 6-cubic-foot kiln) are slightly fluid, some much more so than others, so it is usually necessary to make allowance for this by leaving a little extra unglazed room at the foot.

Glaze 2
(Cone 04–03)

Bicarbonate of Soda	4%
Borax	7
Gerstley Borate	12
Red Iron Oxide	19
Frit 3819 (Ferro)	31
Bentonite	6
Flint	21
	100%

Slow Cool Glaze 2
(Cone 04–03)

Bicarbonate of Soda	4%
Borax	7
Gerstley Borate	12
Red Iron Oxide	17
Frit 3819 (Ferro)	31
Bentonite	7
Flint	22
	100%

Perhaps the best of the recipes presented here, Glaze 2 is easy to apply with a brush, has only a slight flow, yet produces a high quality aventurine with a black undertone.

Glaze 3
(Cone 04–03)

Bicarbonate of Soda	6%
Borax	12
Cryolite	2
Gerstley Borate	19
Red Iron Oxide	16
Custer Feldspar	27
Flint	18
	100%