

Mixing Glaze Tests and Big Batches

The following is a list of practical methods for mixing and testing glaze recipes. Hopefully, something on the list will save you avoidable errors and troubles and keep your testing clean and systematic. The results then will only be as good as the glaze and not poor because of inefficient glaze mixing methods. Everything is very simple, but it gives an outline of what to do and how to work methodically so that your tests done and into the kiln.

First and most important, be sure you are mixing glazes in a well-ventilated area and are wearing the right mask with a good fit. Wear clothes that you leave in the studio so you do not track in toxins into your living area. Read up on your materials and be educated about what you are handling. Always use the recommended safety precautions. There are toxins in mixing glazes and you need to be protected. Mask and gloves are mandatory.

People sometimes have a fear to overcome before they start to mix glazes. They are worried about wasting materials and or are reluctant in general because they have never done this before, maybe have never seen anyone mix before, and do not know how to get started. They have a justifiable nervousness. However, just like anything else, jumping off the dock for the first time, you have to do it to overcome your fear. Doing will empower you and before long, mixing glazes will be second nature to everything else you do well already in your studio.

1. Have your bisqued (green if you are testing once fired glazes) test tiles, bowls, extrusions, etc. ready and have a lot of them. Be sure they are clean and free of dust and debris. There can never be too many, because you may try one recipe with different oxide additions or painted slips, or other variations. My test tiles and bowls usually have a portion of them textured so I can see if and how the glaze breaks.

2. Collect a file of glazes that are of interest to you and write them in a consistent way in a ring binder or on index cards. You can re file recipes as they work or fail in different sections of the binder. You need a legible recipe to mix from. Avoid writing recipes in several different books and places, because by notating multiple copies of recipes, you could be unintentionally playing a game of "telephone" with your numbers. It is easy to make careless mistakes when copying down recipes. Write them down, double check accuracy from your source and keep them in a place where they will not get wet or lost. Write one recipe on each side of the paper, because while you are mixing, your eyes can easily jump between recipes and you can become unsure about what you are doing. Try to write your recipes in the same format each time, so they are easy to follow.

3. When you decide which glazes you want to test, you need to make of list of the materials you need to purchase. Do not spend a lot of money on less than usual materials to begin with. I started with Boron frit, Feldspar, Whiting, Talc, Ball Clay, Bentonite, Zinc oxide, Dolomite, Nepheline Syenite, Kaolin, Talc, Silica and a variety of oxides such as Red Iron, Cobalt, Rutile, Tin, Copper and Zircopax. Secondary to that list is Strontium Oxide, Spodumene, Borax and a host of others I wanted to experiment with. I have 100-200 grams of each raw material and 50-100 grams of the colorants in well sealed containers.

4. Keep your materials in water safe buckets, bins, sealed.

In addition to raw materials, I bought a scale, stole any spoon I could from the kitchen (not to be used again in the kitchen), had a supply of plastic bowls, plastic mixing spoons, small 80 mesh sieve, mask, latex gloves, calculator, a lot of one way cups, a big bucket for glaze test excess (delivered to the designated town dump area for poisons), paper and pen.

5. Mixing Day.

This is mixing day, mixing for as many hours as it takes you. If you think you will require 1 hour to mix 10 x 100gr. batches, give yourself 2 hours. When you mix glazes, mix them finished before going on to any other tasks in the studio. Concentration is important.

6. Have your materials and any accessories for mixing readily available and within reach. Widely scattered buckets, spoons still in the kitchen, scraps of paper, etc. make for unnecessary breaks in concentration and eventual mistakes in mixing.

7. Make a chain of repetitive movements. I find that I can easier catch my oversights if I "feel" that I have skipped a step in scooping, weighing, dumping, setting aside.

Set cup near scale, have ingredient jars clearly labeled and more or less all together.

Keep you recipes close by, but not in the spill zone.

Read through the entire recipe and be sure you have all the ingredients you need.

Be sure your scale is set to the tare weight with whatever container you are measuring your materials into to before dumping into the plastic cup.

8. Start to measure out materials.

Measure the first material, dump it into the cup.

Hold on to your spoon or place it on your counter.. (I like plastic opposed to metal because the materials cling less). Do not leave it in the bucket because you will spend time and lose concentration looking for your measuring spoon.

Write down what ingredient you just measured.

Measure next material, making sure your scale is set at zero again,
Dump into cup, write it down.

Complete measuring out of dry ingredients.

It is a good idea to dump the ingredients in to the cup while the cup is slightly tilted in your hand. This way, you can make the "disappearing test", which simply means if you cannot see a difference in color in the material you just dumped in the cup, you may have measured the same material twice.

Measure oxides last. Make sure to clean the measuring spoon from oxide to oxide to avoid contamination, so that you get an accurate color in the small test batch. Finish dry mixing all the recipes you will test this session.

9. Add water, clear water. This can be done simply by adding a small amount of water and mixing and adding more water until you get the desired consistency.

As you become more secure testing, add your dry ingredients to a small amount of water in the bottom of each test. It will be easier to mix up from the bottom. Sieve into a clean cup and back into the marked cup.

Be careful to add less water than more, because a glaze slurry can become too thin by a small amount of water. I use the knuckle test, but you can also use a hydrometer. As you get more experienced you can judge a particular glaze's "correct" consistency for that glaze and/or the effect you want from that glaze.

10. Blend each cup well. You can use a stalk blender, brush or spoon. Just be sure to blend up from the bottom thoroughly. As you blend up the cups, set them aside so they are not in danger of being knocked over by the blender cord or anything else. Best to let the cups stand over night to "soak" and you will most often get better fired results because the glaze slurry is well blended and hydrated.

11. You are ready to dip your test bowls or tiles. I dip all my glaze tests because that is how I will eventually apply the successful glazes. You can brush on the glazes if you work that way.

For test bowls, I first pour the inside of the bowl, swirl it around and pour out excess back into glaze cup. Then I dip the test bowl into the glaze slurry with a good enough bare margin at the bottom to allow for dripping. Sometimes the glaze is just too fluid and will run off anyway. Then I let the bowl stand in front of a warm air blower until it is dry. I dip the rim and little way down a second time to see how the glaze will behave where thinner and thicker. I use bowls to see if the glaze will pool. Set the test aside.

Otherwise, I use tiles with holes (that stand upright so I can see how stiff the glaze is) in them for color tests. When I dip the tiles, I dip them, again, with a bare margin at the foot. Then I dip the top of the tile again. After firing, I tie the test tiles together into bunches, so I can readily see the progression and effect of increased percents, blended and various pure oxides in the same base.

12. Make a thin solution of iron and water and get a thin paintbrush. Write the name of the glaze and any abbreviations you will understand later to identify the tile after firing on the bottom of the test tile. Keep the name away from an area where fluid glazes may cover it during the firing.

13. Stack your kiln, setting the glaze tests on flat bisqued clay shelf protectors you make from slabs. Put your cones in your kiln. Fire your kiln as you do.

14. Unload your kiln and check the test results. Inspect them in daylight to best see the surface. Feel them and look at them several times. Write down your description of the glaze test (color, texture, surface, feel, stability, etc.) on the page in your book with the recipe. Write any notes about the glaze that you may want to alter in another test, i.e. placement in kiln, thickness of glaze, and substitutions of materials.

15. Keep your test results. They are interesting to look at over and over again and you may need one of the glazes at a later date, although it is not something you need at the present.

16. Any glaze you think you want to mix up in a bigger batch, test again on a bigger surface than the test tile, but not an entire kiln load of your "good stuff". Good first tests are not always repeated for a multitude of reasons. Test the glaze on all the types of clay bodies you may want to use it on for a good fit.

17. Go to start of this description and make sure you are protecting yourself properly from dust and overall contact with these raw materials.

Hope you have many successes.

FOR MIXING BIGGER BATCHES OF GLAZES:

1b. Same safety precautions. The methods are the same, but as you mix more you will find your own patterns and rhythms, becoming more secure in your process. You will not need to double check over yourself as much as listed above.

2b. When you have your 100 gram recipe, figure out how much you want to make, say 5000 grams (fills a 10 liter. bucket), and multiply out your measurements before you start mixing. If the recipe calls for 10 Silica, you will need 50 x 10 of Silica and so on for the rest of the materials.

3b. When you have your dry mix in the bucket, cover it and shake it up, or mix it well with a utensil. I start out with a slightly short liter of water to every 1000 grams of dry mix. Pour 3 short liters of water into a bucket for 5000 gr. dry glaze. Gradually add some of the dry mix as you stir up the slurry with a gloved hand. Or add the mixture and mix the entire time with an electric mixer. Mix in the next liter of water, add rest of dry mix. Check consistency. Add rest of water as needed to give the slurry the consistency you want.

4b. Have an empty bucket ready with a 60 or 80 mesh sieve securely fitted on top of the bucket. Pour the glaze slurry through the sieve slowly and either use a gloved hand or a kitchen brush to stir the slurry around in the sieve and down into the empty bucket. Empty the first bucket completely for lumps, etc. Lift the sieve from the bucket and slide your hand or brush underneath the sieve to release any glaze slurry hanging in the sieve. Blend up the glaze with the mixer if you have one.

5b. Repeat same process again, sieving back into the original bucket.

6b. Your glaze should be tightly lidded and stored at preferably room temperature.

Every time you glaze, mix your glaze well up from the bottom. Some glazes need to be stirred frequently during glazing. If your glaze requires more water, make sure you mix the water well into the slurry before you do a consistency check, as not to be checking the consistency of the top water only. Keep your glazes tightly covered.

Good Luck.

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