Ceramic Stain. Special Class- Revised Feb. 20, 2023 - Jerry Bennett

Ceramic stains are a recent addition to the creative pallet of ceramic artists. Never before in the history of ceramics have clay artists used such clear and precise colors. So, let us begin with the question of what ceramic stains are.

Ceramic stains are frits, glass with high concentrations of metal oxides fired in a kiln, cooled by drawing the material into water and then grinding the colored glass into a very fine powder. This process of fritting oxides. It has many advantages for ceramics;

1. Ceramic stains can produce unique and specific colors that oxides can’t. Stain manufacturers can target particular colors and use various bases to achieve those colors.
2. Industry needs consistent colors that do not vary over time. Therefore, they set color values and continue to make the same products.
3. Ceramic stains or Frits with oxides of metals are safer to use. Read all safety information and wear breathing protection. Ceramic stains do not prevent toxic materials from leaching out of finished ware. If you are producing pottery for commercial use, have your pottery tested for toxicity.
4. Stain companies produce multiple “systems” (chemical combinations) to create the same colors for industry. Victory Green is an example produced by Mason Color. They make several different versions of this critical color for various industrial needs.
5. A recent innovation in stain manufacturing is reducing the particle size of stains. This change is both an advantage and a disadvantage to artist potters. Commercial users of stains have found that smaller particle sizes of pigments can use less of the materials. This reduces their costs by reducing the amount of stains consumed and getting the same results. But, you will notice that some stains are harder to mix into your glazes. This is because they float on the top and won’t blend into the glaze. Instead, add a slight deflocculant to the glaze, or the frit will hydrate and mix with the glaze over time.

There are several elements that affect glaze and stain colors. In the glaze composition, the main one at mid-range firing is Zinc in the glaze. Zinc is a standard flux in glazes and profoundly affects the glaze surface and color. Many stains will not work with zinc present in the glaze. For Mason Color, they designate a number system to tell you which stains you can use with Zinc.

1. #5 Do not use Zinc in the glaze.
2. #6 May be used with Zinc or without Zinc.
3. #7 Zinc is not necessary but gives better results.
4. #8. Best results with no zinc.

Other Mason numbers for stains:

1. #1a. Use only as a body stain.
2. #2. Max firing to 2156 F (1180 C)
3. #3 Max firing to 2300 F (1260 C)
4. #4 Max firing to 1976 F (1080 C)
5. #9. Glaze must contain. 6.7% to 8.4% calcium /CaO For colors requiring Zinc, most of the “Brown” colors, try adding 2% Zinc Oxide to the underglaze recipe. Use this only for the stains listed as #9.

Painting over glazes with ceramic stains is a problem. Ceramic stains are “refractory.” Refractory means they won’t melt into the glaze below without help. Underfired ceramic stains on the surface of the glaze may leach or shed into food. Great care should be used when using this technique.

One way to lessen this problem is to use the High Calcium Clear Glaze – cone 6, with 5-10% stain. Mix this with two parts water and one part of Spectrum Brushing. Media (Product number 1070). Other authors have recommended using frit 3124 or 3110 in equal parts to the stain and adding V. Gum or CMC.

To begin using stains in glazes, follow these simple steps until you have some experience. Then through testing, expand your range and use.

1. First, avoid body stains in glazes. They can be much stronger than regular stains.
2. For Green, Blue, and Black\*, the starting range should be .3% to 5%
3. For Red, Pink, Yellow, and Purple, the range should be 2% to 8%
* Always use. “Best Black” #6600

For Colored Clays - Use Body Stains

When using plastic clay (clay sold in plastic bags), consider 28-30% of the total weight to be water. The calculation of the stain to be added is based on the “dry” weight of the clay.

1. For Green, Blue, and Black\*. The starting range should be 3% to 5%
2. For Red, Pink, Yellow, and Purple, the range should be 5% to 10%

Safety warning- When working with glaze materials, wear a dust mask, and avoid making dust. Read safety sheets on materials and follow warnings. Dispose of materials according to the safety sheets.

Test all glazes before putting them on your valuable work.

Price comparison as of June 1, 2021, second comparison on 2/20/2023:

USPigment.com. $143.00 (2021) $154 +11% (2023)

Theceramicshop.com. $194.41 (2021) -17% $177.12 (2023)

Axner.com. $189.00 (2021) +36% $255.87 (2023)

Baileypottery.com. $127.00 (2021) +27% $160.70 (2023)

Purchase of 1 LB each of 6026, 6024-6027, 6600, 6266, 6204,6376, 6700, and 6020. Prices do not include shipping.