

Triaxial Blend: Stains in a Base Glaze

A triaxial blend is a method of testing three ingredients on a three-axis system similar to a two-ingredient line blend. Often triaxial blends are used to test the primary ingredients in a glaze base, (for example, feldspar, whitening, and kaolin). It is often employed when you don't have a percent analysis to reference. If you have a percent analysis, you can use a glaze software program to predict glaze surfaces, but if you don't, a triaxial blend is the empirical method to see how they melt.

Another use of the triaxial system is color blending. In this method, you keep the base glaze the same and vary the colorants (oxides or stains or even opacifiers). In this triaxial color blend, I tested various stains to develop different colors. Since we do not know the exact amounts of oxides in commercial stains, blending them in a triaxial can reveal surprising and unusual colors.

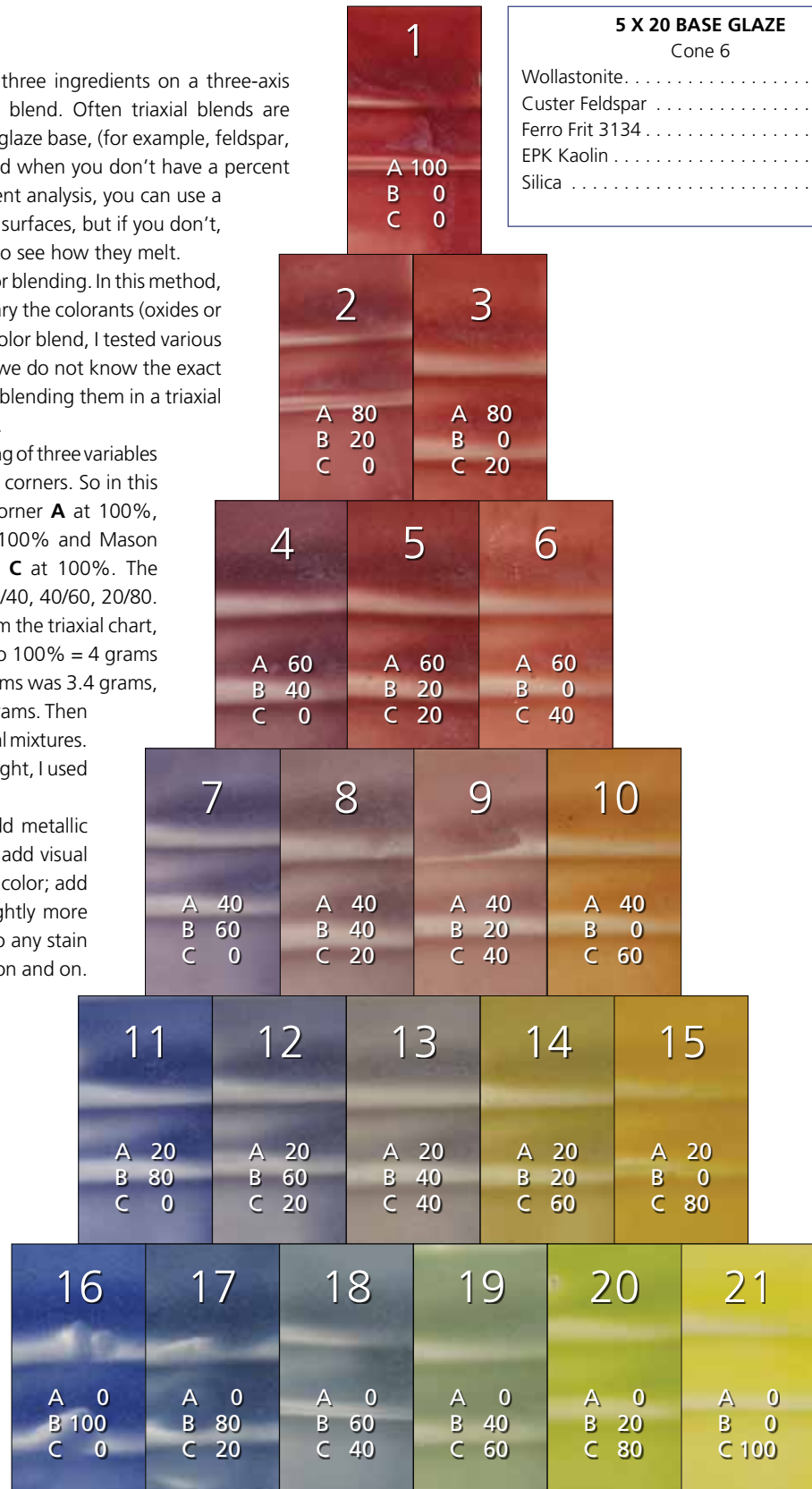
A 21-point triaxial is a systematic blending of three variables with 100% of each variable at the three corners. So in this case, Mason Deep Crimson #6006 is corner **A** at 100%, Mason Sky Blue #6363 is corner **B** at 100% and Mason Praseodymium Yellow #6433 is corner **C** at 100%. The flow along the vertices is then 80/20, 60/40, 40/60, 20/80. Instead of using the numbers directly from the triaxial chart, I used 4 grams of stain at each corner. So 100% = 4 grams and then I figured out that 80% of 4 grams was 3.4 grams, 60% was 2.4 grams, and 20% was 0.8 grams. Then I substituted those numbers into the triaxial mixtures. For the triaxial glaze chart shown at the right, I used the 5 x 20 Base Glaze as shown below.

For additional testing you can also add metallic oxides to stains to change the colors or add visual textures; add 3% Zircopax to brighten a color; add 3% titanium dioxide to make colors slightly more variegated; add 1% copper carbonate to any stain to push it toward green. The list can go on and on.

21-Point Triaxial Blend Grid: Hansen 5 x 20 Clear Glaze mixed with **A**-Mason stain Deep Crimson 6006 (Cr, Sn), **B**-Mason stain Sky Blue 6363 (Co, Al, Si), and **C**-Mason stain Praseodymium Yellow 6433 (Pr, Zr, Si,) dipped on porcelain, fired to cone 6 in an electric kiln.

A

| 5 X 20 BASE GLAZE Cone 6 | |
|-----------------------------|-------------|
| Wollastonite..... | 20% |
| Custer Feldspar | 20 |
| Ferro Frit 3134 | 20 |
| EPK Kaolin | 20 |
| Silica | 20 |
| | <u>100%</u> |



B

C