

Appalachian Center for Crafts - Clay Studio

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Mason Color Works White Underglaze Base

This recipe for an opaque white underglaze base comes from the Mason Color Works of Liverpool, Ohio, manufacturers of Mason ceramic stains. It's been in use for decades, and seems to give good results for underglaze brushwork. Like most commercial underglazes, it is not appropriate for trailing or other thick-application techniques.

Dry Materials

F-4 Soda Spar ----- 20
Kaolin ----- 10
Ball Clay ----- 5
3124 Frit -----10
Zircopax ----- 5 (or any other zircon opacifier)
Total Dry Materials ----- 50

Add Underglaze Liquid -- 75

For colors other than white, add:

Ceramic stain ----- 40

Add the stain after everything else is combined, including the underglaze liquid. Vary the amount of stain for a darker or lighter color, and of course if you add a significant amount of stain you will need to add additional water to adjust the consistency of the final mix.

To make the underglaze liquid, combine:

Non-toxic antifreeze ----- 2 parts
Water ----- 2 parts
CMC Liquid ----- 1 parts

To make CMC liquid, stir 30 grams of dry CMC in 1 qt. hot water and let it sit for 2 days.

Be sure to use non-toxic antifreeze! Normal antifreeze is ethylene-glycol and is toxic. Instead, use non-toxic propylene-glycol antifreeze. It's available in auto-supply stores and is safe for people and pets.

The CMC gum and propylene glycol in this mixture make it thicker and smoother than a slip containing only water, giving a smoother brushing consistency especially when applying underglaze to dry greenware or bisqueware.

When making this recipe:

Dry-mix all the dry ingredients, add about 3/4 of the underglaze liquid and blend thoroughly, and then blend in more underglaze liquid a little at a time as needed until you achieve the desired brushing consistency. You may not need the full amount of underglaze liquid.

Clarification

This recipe can be a bit confusing. When a recipe just provides numbers without specifying the weighing increments, the increments can be whatever you wish – grams, ounces, pounds, etc. For the sake of accuracy when mixing glazes or slips, we generally use grams. With any recipe, there is always the question of what factor to multiply the base recipe by in order to get a certain amount of final product. For example, glaze recipes are almost always given in a form where the dry raw materials for the glaze base add up to 100, plus the modifiers, colorants, etc. In a recipe that contains only dry materials, we know from experience that a batch of 12,000 grams of dry material will fill a five-gallon bucket to the rim once combined with water. But this recipe includes underglaze liquid added by weight, and that does confuse matters. Since the instructions tell us to make a quart of CMC liquid, a logical starting point is to figure out the whole recipe based on using that full quart of CMC liquid in the underglaze liquid, adjusting all the other amounts proportionally. As explained below, by doing this we end up needing a little over 3000 grams of dry materials, and the recipe produces about a gallon and a half of underglaze base.

Here's how we figured that. Combining one quart of CMC liquid with two quarts of water and two quarts of non-toxic antifreeze as per the recipe gives five quarts of underglaze liquid. A quart of water weighs 946 grams. Multiply that times five (five quarts) to get 4730 grams of underglaze liquid. The recipe specifies 75 measuring units of underglaze liquid, and if we divide 4730 by 75 we get 63.07, rounded off to 63. Thus if we use the whole five quarts of underglaze liquid, in order to get the correct proportional amounts of dry materials we multiply each amount by 63, which gives a total dry materials weight of 3150 grams. Based on these calculations, our recipe is:

F-4 spar -----	20x63 = 1260 grams
Kaolin -----	10x63 = 630 grams
Ball Clay -----	5x63 = 315 grams
3124 frit -----	10x63 = 630 grams
<u>Zircopax -----</u>	<u>5x63 = 315 grams</u>
<i>Total weight of dry materials</i> --	3150 grams
<u>Underglaze liquid -----</u>	<u>75x63 = 4725 grams</u>
<i>Total weight of batch</i> -----	7875 grams

Since 12,000 grams of dry glaze materials yields a full five-gallon bucket of glaze, we can extrapolate and estimate that since the dry materials weigh 3180 grams (including the CMC gum), this recipe should make about six quarts, which is a lot of underglaze base.

If you want more or less underglaze base, just proportionally adjust the number of grams of everything, and adjust the quantity of CMC liquid and underglaze liquid that you prepare.