



## Basic Information on UGC Kiln Fired Glass Colors

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### What are the differences between our NT Colors, Original Colors and Artisan Colors?

The NT line comes in a powder form that needs to be mixed with Glass Medium on a 1:1 ratio, are not as transparent as the Original Colors, contain no lead and have colors that are not available in the Original Color line.

The Original Color line comes in a liquid state and feature some colors not available in the Non-Toxic line. They contain lead which enables them to flow more smoothly and to be more translucent or transparent. When fused between layers of glass, bubbles will form between the layers.

The Artisan Colors comes in a powder form that needs to be mixed with Glass Medium, contain no lead and will always form bubbles when fused between layers of glass and create a darker texture when fired on top of the glass. Please visit the Shop at [www.uniqueglasscolors.com](http://www.uniqueglasscolors.com) for additional details on the UGC Color Lines.

### Which ones to use: Where and Why.

All of the color lines can be used on decorative items, glass panels, glass tiles, glass to be used in a stained glass project. *Test for compatibility on actual varieties of stained glass.*

NT's are great for use in all of the above, for use in schools and when creating items that will come in contact with food.

Artisan Colors, again all of the above.

The Original Color line is great for all of the above but need to be used on the ***back*** of any item designated to be used with food because of the lead content. To make a "food-safe" item you would fire on a drape mold and then the actual colors would end up on the back side of the piece making the front "food-safe".

### On what surfaces can both Original Colors and Non-Toxic/Lead Free colors be used?

All three color lines were developed to be used on ordinary window glass or "float" glass, COE 90 and COE 96 glass, as well as classic art glasses such as Uroboros, Kokomo, Bullseye, etc. They can also be used on commercial tiles, terra cotta, porcelain, Corel brand dinnerware, and "found" glass (bottles, table tops, old windows, etc.) *Before starting any project a test application on your chosen glass is recommended.*

## HOW TO APPLY COLORS

**Keep all color stirred as you are using them as the pigments tend to settle to the bottom of the jar.**

### **NT and Artisan Colors**

Mix the powdered color with Unique Glass Medium on a 1:1 ratio then add a drop or two of water if necessary so they are the consistency of “heavy cream” or “melted ice cream”. Colors can be mixed and stored in an airtight jar (we sell 1 ounce jars with lids on our website for your convenience). Some of the colors settle faster than others, *so all must be stirred well* before using again.

There is a wide variation in how the different colors settle.

A note on the Artisan Colors. When using to create “lines” of color with a brush make the consistency a bit thicker so the lines of color stay in place easier and don’t spread out.

Keep color stirred as you are using them. Color tends to settle as you are working. Fluid consistency is very important. If the applied color does not level itself, the consistency is too thick – dilute using the Unique Glass Medium or a drop or two of water. If it is applied too thickly, it may curl back and pop off as it dries or pull back from the glass during firing.

**To apply colors for the most solid coverage** - you need to **“Puddle, push & pull”**. Use a brush (10/0 liner for small areas, a small round for other areas. Pick up color and drop a small **“puddle”** of color to your surface then **“push”** and **“pull”** the puddle to apply. Add another puddle, push and pull until you have filled your area with color. **DO NOT BRUSH THE COLOR OUT OR “PAINT” IT ON UNLESS YOU WANT STREAKS IN YOUR COLOR! IT IS NOT PAINT!** A thin application will result in streaky color after firing. You **should not** be able to see through the wet color. Look at you work from underneath the glass as what you see there is how it will fire. If you make a mistake, let the color dry and scrape off with an Xacto knife or toothpick and brush off the chips and dust created with a soft brush and re-do the area.

**To shade or highlight with colors**, you need to **“pat, wiggle & muddle”**- apply colors side by side and blend by the using the tip of the brush to **pat** or **wiggle** between the colors to blend. To **“muddle”** push the color around with a larger brush in a more random, free-flowing manner.

**To apply colors for a watercolor look** – Leave water in your brush so the colors become thinned as you apply them to your surface. Tilt your glass so the colors run down your glass &/or run together. Note that colors will not be as strong as extra thinning has taken place. Be careful not to thin too much or you will have weak or no color. Test, Test, Test!!!!

When applying color and it is "beading up" on your glass - rub over the area with a toothpick and reapply the color.

“Beading/Crawling” (color pulls in on itself or forms separate beads of color) as you apply the color. This may be caused by the surface not being properly cleaned, or oil left behind in a fingerprint.

**Outlining a design** - Use Outline Black or Outline White in the Decorator Bottle with the metal tip or with a small brush. When filling the Decorator Bottle be sure to first wipe off the rim of the jar to prevent little bits of dried color from around the lid getting into the applicator bottle and clogging the metal tip. Place a damp piece of paper towel over the tip and just set the plastic cap over that or place the cleaning wire down into the metal tip when you want to keep the Outline color ready to use (in case you forget something!) When you are done with the tip, unscrew it and place it in a container of water until you are ready to clean the tip. Keep an extra Decorator Bottle on hand, fill it with hot water, place the dirty tip on and squeeze clean water through the tip until clean.

**Clear Glaze (950T)** This is from the Original Colors line so contains lead. Use when you want to slump, sag/drape a piece of glass with no color or use it in a design where some of the areas are clear. You can also coat real copper for inclusions in your fusing and it will keep the copper shiny.

**Let color dry completely before firing.**

## PREPARING THE GLASS

There are many ways to clean your glass; here are the two we use most often.

- A. Scrub both sides of the glass with a powdered abrasive cleanser and a green grit pad. Dry thoroughly. Make a brushstroke of just clear water on each side, the side that beads up most is the “tinned” side and should not be used for the colors. It won’t hurt the colors, you just have to rub over the area with a wooden toothpick and the colors lays right down – it is just a nuisance to have to do that!
- B. Use very hot water and a hard bristled scrub brush.
- C. Rub down with denatured alcohol (flammable). We use this method only when teaching in a classroom situation and water is not available.

**Do not use rubbing alcohol or glass cleaners** as they may contains oils &/or silicone and will cause the color to crawl and bead up.

Glasses normally used: single and double strength window (“Float” glass), framing glass and stained glass.

*Framing glass* is very thin and is good for very small items or where weight is a problem. It is usually hard, has a tendency to be brittle and harder to cut and normally two or more thicknesses are used when fusing.

*Single strength window glass* is light weight and is good for smaller items and dishes less than 10” in diameter. Two pieces are great for fusing. It is about 1/8” thick.

*Double strength window glass* is thicker, about 3/16”.

*Stained glasses* vary greatly and need to be test fired before using in a design as colors can change and to find out the bending properties of the glass.

## FIRING GLASS COLORS

Use **Unique Glass Separator** on your kiln shelves and sagger/drape forms so the glass does not stick. Use **Unique FREE** to allow the glass to move “freely” on the firing surface. Place it in an old cotton sock and dust over the area where the glass will be, then apply every 2 or 3 firings after the first firing or each time to be sure.

**ALWAYS FIRE WITH GLASS COLOR FACING UP!** If you fire with the color down, whatever it touches will become permanently attached! Now of course there is an exception to every rule so you can fire with the color down as long as it is on fiber paper or fiber blanket or when it is in between layers of glass.

Our very best advice on firing is to contact your kiln manufacturer about firing your kiln and to always test fire before beginning a project to be sure you get the results you expected.

There are many good reference books on Glass and Firing. The two we use the most are:

- **“Warm Glass”** P. Beveridge; I. Domenech; E. Pascual. Lark Books/Sterling Publishing Co, New York, NY
- **“Glass Notes”**. H. Halem. Franklin Mills Press. Kent Ohio.

The Basic Theory for firing glass: (these steps are modified depending on the size, thickness and effects you are trying to achieve in your piece)

1. Heating phase to warm & prevent thermal shock. (The thicker/bigger the piece – the slower.)
2. A rapid increase to your working temperature and then “soaking” or holding.
3. A rapid decrease in temp to around 1100-1000 F and “soaking” to allow equilibration.
4. Between 1100 and 850F cooling must be slowed and controlled. You can never go too slowly in this step! “Soak” or “Hold”, again to allow Temperature equilibration (the Annealing Phase)
5. Then a regular decrease in temp to room temp.

The following info on firing is based on what Margot does in her ceramic kiln and what Dr. J does in his glass kiln. You **MUST** do a test firing in your own kiln to see how your particular kiln fires and what gives you the best results. Remember, firing is based on time and temperature. **Test, test, test!!!!**

**Firing in a ceramic kiln with cones** - Peep holes are left in for the full firing. Fire 45 minutes on low, 30 minutes on medium keeping the lid vented about 1” during the first hour. Cool to room temperature, cold is even better! Generally, most ceramic kilns will be cooler at the bottom and hotter at the top, usually 017 at bottom, 016 in middle and 015 at the top for a 016 cone firing. By using witness cones you will find if you have hot and cold spots in the kiln and can then fire accordingly. Raise the bottom shelf 4". Do not place anything at the very top as this is usually too hot.

**Firing in automatic/progression ceramic kiln** - Set the heat rise to 450 degrees and fire to 1517 degrees (016). For cone 017 it is 1445 degrees and for cone 015 it is 1550 degrees. Again, vent for the first ½ to full hour.

**Firing in a programmable glass kiln** – (For small pieces less than 10” using “Float” glass) Again, vent for the first ½ to full hour. Heat rise of 450F/hour to approximately 1000F. Full speed to 1450-1525 and Hold or “Soak” for 10-20 min. A full speed decrease in temp to approx 1000F, hold for 10 min. A slow controlled decrease of 100F/hour to 850F and again hold for 10-30 min. A rapid decrease in temp, with the lid still down to room temp. You can NEVER go too slowly in your annealing phase!!!!!!

**All kilns** - Keep glass to center of kiln away from firing elements and be sure all elements are firing properly.

## FIRING PROBLEMS

If the middle of the glass edge forms sharp, needle like points, it is over-fired. If the edges just feel rough or are still straight it is under-fired. Colors should be fine on both.

Firing UGC Reds – Vent your kiln, be sure you are not using a kiln that fires other things that may leave a residue behind to affect the reds, apply sufficient color and apply it evenly, be sure it is dry before firing.

If the color is dull and tends to rub off after firing it is very under-fired.

If colors turn gray after firing, possible cause could be cleaning the glass with glass cleaner which can leave a residue or not enough ventilation in the kiln during firing.

Crawling during firing is caused by too heavy of an application of color or if color was not properly thinned. Remember, it must be the consistency of heavy cream or melted ice cream.

## UGC Specialty Products

**Unique Bubble Powder** - Mix a small amount (no bigger than a small pea) with glass color and place dots of the mix where you would like raised bubbles. The size of the dots controls the size of the bubble. Must be used between two pieces of glass. Mix into NT's at 1/8-1/4teasp per ½ oz of dry color for nice random bubbling.

**Fiber Firing Paper** – Use this when you want a nice smooth finish to the back of your glass or when firing on a kiln shelf that really needs to be cleaned and recoated with our Glass Separator. Cut the paper just a bit larger than the size of the glass. **Fiber Paper is not reusable!**

**Gold Leafing** – a nice touch to add after firing.

**Unique Glass Sand** – mix with any of the Fired Glass Colors to create texture. Aim for 1:1 mixture but be sure you have a bit more color than you do Glass Sand or it will pop off after firing. You can also add less Glass Sand for just a bit of texture

**Unique MUD** – Comes in White and Black and can be used as is (White only) or tinted with any of the NT colors (resulting color will only be a pastel). Fire between 1445 and 1550 along with UGC colors or can be fired cooler if desired. The hotter it is fired the shiner it becomes.

## MISCELLANEOUS

Colors may be brushed, sponged, air-brushed, stippled, stenciled and spattered.

Apply over fired glaze and you have beautiful overglaze colors! Note: When planning to use over fired glaze a test fire is most important to see if the products are compatible when they fire. .

To airbrush – On glass, spray an even coat and allow drying before applying another coat to prevent runs and sags. Two to four coats should be sufficient.

On a drape mold or reverse glass painting - add details like eyes with the Outline Black directly on the glass and cover with opaque color. The details show from the front but not the back.

Something we find helpful is to have extra tips on hand and if we get a clog just take off the clogged tip, place it in the water, put on a new tip and continue on with your design.

If firing glass that has a predrilled hole in it, fill in the hole with Unique's Glass Separator before firing to keep the hole from filling in during firing as the glass moves. The fired Glass Separator just pops out after the firing.

**Remember – Test, Test, TEST! And.... HAVE FUN!**

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