

Glass Fusing – The Basics

Glass fusing is one of the fastest growing, and exciting new trends to develop in the fired arts world since the introduction of the Contemporary Studio. It seems everywhere you look now in galleries, museums, and gift shops... you will find fused glass artwork.

Until recently most all of the glass art seen in the market was either blown glass or stained glass. These disciplines can take a great deal of time to develop the skills necessary to produce even a simple piece of artwork. With fused glass a whole new world has been opened up for the novice hobbyist. With very little instruction just about anyone can make an attractive platter, fused jewelry, or picture frame in about the same amount of time it takes to decorate a ceramic project. The ultimate key to success is the firing, and that is where you come in.

The Kiln

More than likely you will be able to use the kilns already in your studio for firing glass. Instead of using the ConeFire Mode you will write a custom glass program using the Ramp/Hold mode, which is found on most electronic kilns. It is important to note that glass does have different properties than ceramics and the techniques to firing will be different.

One of the most significant differences, other than the temperatures, is that glass is much more sensitive to the rate at which it is cooled. You must carefully control the cooling rate between 1000°F and 750°F. This is nearly impossible to do without a programmable controller. So if your kiln is equipped with only a KilnSitter, you may want to look into getting another kiln for fusing glass.

Another aspect to consider is that glass is extremely sensitive to unevenness in heating. This will affect how you fire your kiln in two ways.

Traditionally glass is fused on one layer of the kiln and heated from the top by an element in the lid. Since the kilns in your studio have elements in the side, it will be necessary to slow down the firing to insure the edges near the elements do not reach temperature sooner than the glass closest to the middle of the kiln.

Secondly, at lower temperatures larger kilns tend to fire less evenly from the top of the kiln to the bottom. Therefore for larger pieces you may want to consider using only one layer of shelves located at a height close to the thermocouple.

Kiln companies make kilns designed to fire glass on multiple layers however they are generally equipped with a controller which can regulate the temperature in different layers individually. This is generally known as a Zone Control option. If glass fusing becomes a significant portion of your business you may want to consider buying a kiln specifically designed for firing glass.

Kiln wash used for coating the kilns for ceramic pieces is different than kiln wash used for fusing glass and may stick to the glass. Your glass supplier should carry kiln wash specifically for glass. You will more than likely want to have a shelf that is used only for glass fusing.



General Fusing Information

One of the best ways to learn anything is to actually do it. I would highly suggest taking a fusing class prior to opening a fusing segment of your business. Classes may be available to you locally. Try contacting a distributor in your area to see who is offering them. If there are no classes available you can go to one of the national shows.

You can find many examples of glass firing right on the web. There is also excellent information regarding the general principles behind firing glass such as compatibility, annealing, coefficient of expansion, techniques and much, much more.

Here are a few good links:

www.warmglass.com - This site was developed by Brad Walker, the author of Warm Glass. This is a great place to start. It is loaded with definitions of glass vocabulary and provides easy to understand descriptions of the fundamentals of art glass.

www.system96.com - This is the web site for Spectrum Glass. They manufacture System 96, which is a line of glass specifically designed for fusing glass.

www.uroboros.com - This is a web site for Uroboros glass. Uroboros produces system 96 glass as well. They also produce their own line of fusible glass.

www.bullseye-glass.com - This is the site for Bullseye Glass, another manufacturer of fusible glass.

www.glasskilns.com - This is the Skutt Glass Kiln web site. It contains general information on glass kilns as well as general information on firing glass and suggested firing schedules.

www.paragonweb.com - This is the Paragon Kiln web site. It contains information pertaining to glass kilns.

www.originalsinglass.com - This is a site developed by artist and studio owner Lisa Vogt. In it you will find information on a book called "All Fired Up" which describes in detail how to start a fusing program.

You may find that each site recommends a slightly different firing program. That is because each glass is slightly different. When in doubt, go with the program recommended by the manufacturer of the glass you are using.

The Glass

There are many manufacturers of glass but only a handful that make glass that is compatible for fusing. Glass needs to have the same Coefficient of Expansion to be compatible. Glass that expands and contracts at different rates will crack or separate when fused. For information on the various types and shapes of glass available for fusing visit the glass manufacturer links above.



Tools and Accessories

Beside the kiln you will need to have cutting tools and safety glasses. Cutting glass can be intimidating to say the least. There are certain cutting systems, which are relatively inexpensive and allow novice users to make difficult cuts with ease. Ask your local glass supplier for recommendations on cutting systems.

They also make band saw type saws and electric grinders specifically for cutting glass. These tend to be a little noisy and may affect the ambience of the studio.

Other Considerations

Inevitably you will end up with bits and pieces of glass on the tables and floors of the glass area. For this reason you may want to have a separate area set aside for glass in your studio. When customers are in this area they will be instructed on the proper safety precautions to take and will be equipped with safety glasses. Glass projects tend to consist of glass placed on top of other glass. When moved to the kiln, these projects can shift and you may not know the original intent of the artist. Therefore you may want to encourage the use of glue in attaching pieces. One interesting property of glass is that it will always seek a level of $\frac{1}{4}$ ". Therefore a $\frac{1}{8}$ " piece will contract and anything over $\frac{1}{4}$ " in thickness will expand its footprint.

Keep this in mind when you are loading the pieces in the kiln. Pieces can fuse to other pieces or even melt over the shelf if you are not careful. It is important to pick projects that are not only simple, but are also attractive. Provide samples which are done well and have the maximum potential for attracting new customers. Glass fusing is an excellent compliment to ceramic art and a great way to grow your business.

Good Luck!

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