Clayworks

Glass Art for Potters

You CAN fire glass in a pottery kiln. It's easy if the kiln has an electronic controller but unreasonably difficult if it's manually operated or relies on a kiln sitter with cones. There are many similarities between firing clay and glass and many differences.

The Kiln.

Glass kilns are more shallow then pottery kilns because glass is almost always fired only on a single layer. They also usually have elements in the lid to produce the more even heat distribution needed to fire glass. However, you CAN fuse glass in a pottery kiln – BUT – only if it has an electronic controller. A kiln relying on pyrometric cones can reach the required temperature but is NOT accurate enough for fusing glass and can NOT apply the regulated ramp speeds and holds needed for glass.

Single Layer Only

You can load multiple layers of shelves in a clay firing but can NOT for glass. Temperature accuracy is much more important for glass. The ONLY level in the kiln where the temperature matches the reading from the thermocouple is level with the thermocouple. Something on a lower shelf will be a lower temperature and something on a higher shelf will be a higher temperature. This temperature difference is acceptable for firing clay but NOT for glass. If you load multiple level shelves the way routinely done for clay you will get significantly different temperatures at different levels. This would be okay if you want to fire everything hot enough to fully melt but NOT okay if you wan some pieces to be only part fused.

Compatibility

Just as different clays won't reliably bond together in a kiln firing if they aren't compatible, even more so with glass. Low fire clay won't bond reliably to mid-range clay. Glass compatibility is determined by COE (Coefficient of Expansion). That's the measure of how much the glass expands when heated and contracts when cooled. If two pieces of glass are fused together that are not matching COE the different expansion rates will cause them to crack.

Temperatures

Temperatures for firing glass are considerably lower than for clay. At 1200F (677C) glass is as soft as cooked pasta and will bend to copy the shape of anything it sits on into. At higher temperature the glass becomes softer until at 1450F (788C) it is full molten and will flow to a common layer. At higher temperatures glass becomes increasing softer.

Firing Schedules

Firing Schedules for Clay are simple. Basically, just heat up to top temperature and turn the kiln off. Firing schedules for glass are considerably more complicated usually requiring carefully controlled temperature change and holding at a specific temperature at various stages in the firing.

For example, a schedule to fully fuse a 6mm thick project might be:

1. 400F (205C) degrees per hour to 1000F (538C) then hold for 60 minutes.
2. 800F (427C) degrees per hour to 1450F (788C) then hold for 20 minutes.
3. Fast As Possible cool to 960F (515C) hold for 60 minutes.
4. 400F (205C) degrees per hour to 600F (316C) OFF.

A schedule or a similar project with variable thickness for a part fuse might be:

1. 300F (150C) degrees per hour to 1000F (538C) then hold for 60 minutes.
2. 800F (427C) degrees per hour to 1350F (704C) then hold for 15 minutes.
3. Fast As Possible cool to 960F (515C) hold for 60 minutes.
4. 300F (150C degrees per hour to 400F (205) OFF

A comprehensive tutorial on **Understanding Firing Schedules** is provided in downloadable PDF in the Tutorial section of the Glass Campus website. www.glasscampus.com

Thermal Shock

Clay is susceptible to thermal shock if heated or cooled too fast but glass is MUCH more delicate and MUCH more likely to crack if heated or cooled too quickly. That's why the rate of temperature rise and fall is so critical.

Viscosity

Viscosity variance is only a small concern with clay or glaze but is a HUGE issue with glass. Any difference in viscosity is the same as with compatibility and is as important as COE