

# Firing Notes

It is very important to get to know your kiln in order to fuse successfully. Many kilns will fire to a different temperature than the read-out indicates. Firing schedules should be written assuming that the kiln to be used will fire to the temperature it is directed to fire to by the operator. It is up to the kiln user to know whether a firing schedule should be adjusted to fit the idiosyncrasy of a given kiln.

At Creative Paradise, Inc. we have recently acquired a couple of new glass kilns. Upon first use it became clear that these new kilns fired much hotter than our original glass kilns. We had to figure out approximately how much hotter to know how to adjust firing schedules for the two new kilns. Instead of investing in more equipment to give us a superbly accurate temperature read out, we created a process of firing test tiles to figure it out with a relative degree of accuracy.

To help demonstrate this testing process we have used our DT25 Greenman mold found in our DT25 Greenman tutorial as an example. The DT25 Greenman Tutorial can be found on our website or by [clicking here](#).

We cut two 1" square pieces of COE 96 Double Thick Clear and stacked them together and cut a 1" x 1.5" Black stacked with 1/2" x 1" opaque Yellow and placed these test tiles along with projects in each kiln firing and made notes.

Through this process we found out how to adjust firing schedules with each kiln. The Greenman firing schedule is one written to end in a full fuse with slow ramps and bubble squeezes added below the working temp.

The slow ramp is necessary with the project because large sheets of glass are being fused. Whenever fusing large pieces of glass it is wise to ramp slowly below 1000 degrees to avoid thermal shock in the glass. Glass being held on raised texture (as in the Greenman project) is even more susceptible to thermal shock.

The long holds below the working temp of 1465 are there to allow the glass to soften and ease into the many low areas of the texture mold and for the two 12" x 12" of sheet glass to come together without trapping air between the two layers. This process needs to happen at temperatures below 1250 degrees to be most successful.

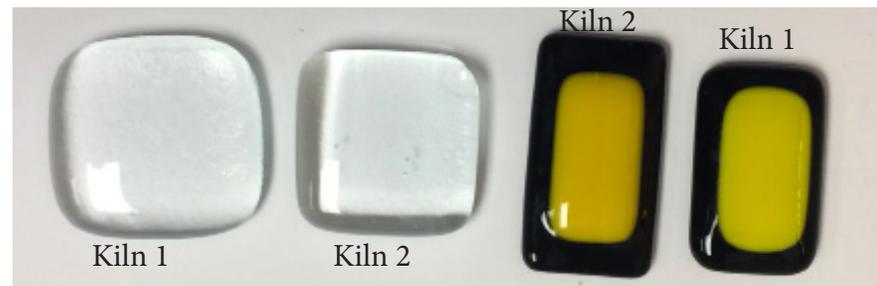
Segment	Rate	Temp	Hold
1	200	1215	45
2	50	1250	30
3	250	1330	10
4	300	1465	10
5	9999	950	90
6	100	500	5

If a kiln is firing hotter than the read out indicates, the critical bubble squeeze will be missed and the glass will be over-fired, creating sharp, serrated edges on the fused glass.

Depending upon how far off a kiln is firing, the glass separator can even fail.

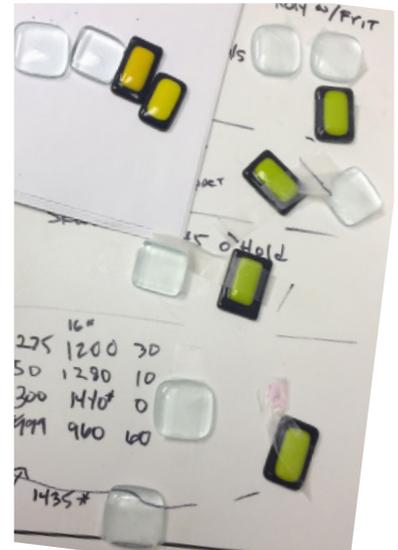
For example the glass in our DT25 Greenman tutorial was fired in a kiln that we know to fire hot. Through the test tile process we have estimated it to fire about 20 degrees hotter than expected. We adjusted the firing by taking 20 degrees off of the holding temp in each segment.

The test tiles labeled "Kiln 1" were fired in the kiln with the Greenman project using an adjusted firing schedule (top temperature of 1445). The test tiles



labeled "kiln 2" were fired using that same adjusted firing schedule in a kiln known to fire with relative accuracy. It should be clear that one of the kilns fired hotter than the other regardless of the firing schedule that was entered into the controller.

**Please be aware that we do not recommend using Slide's "Hi-Temp" glass separator on our CPI molds. The Boron Nitride Spray that we recommend using and that works best for us is ZYP.**



An example of test tiles with notes gathered with time and firings.



Test tiles fired in the kiln with the DT25 Green Man Texture.