

The Kiln Corner—

Special Kiln Programming

by Arnold Howard

Though I work for Paragon Industries, L.P., the information in this column applies to all brands of glass kilns. Feel free to send questions for this column no matter what brand of kiln you own.

Combining Schedules

The customer wanted to combine Firing #1 and Firing #2:

Firing #1

Segment 1: Ramp 650°F per hour to 1000°F. Hold for 2 hours.
After the kiln has cooled down to 200°F, begin Firing #2.

Firing #2

Segment 1: Ramp 650°F per hour to 1000°F.
Segment 2: Ramp 380°F per hour to 1525°F. Hold for 2 hours.

The Combined Firing

Segment 1: Ramp 650°F per hour to 1000°F. Hold for 2 hours.
Segment 2: Ramp at Full to 200°F, no hold.
Segment 3: Ramp 650°F per hour to 1000°F, no hold.
Segment 4: Ramp 380°F per hour to 1525°F. Hold for 2 hours.

In the combined firing, the segment 2 ramp is Full. Since segment 2 is a cooling segment, a Full ramp will turn off the heating elements. They will not turn back on until segment 3 begins.

A heating segment Full rate means to heat as fast as possible. The elements will stay on continuously during that segment. A cooling segment Full rate means to cool as fast as possible. The elements will remain off for that segment.

I've been working with Prometheus bronze clay, putting it in a kiln preheated to 1472°F. The temperature overshoots to as high as 1515°F after I put the piece into the kiln. What ramp would you recommend to avoid overshooting? Is it possible to program a full ramp to get to temperature quickly, then shut off the kiln and reprogram a slower ramp so that I can put the piece in with less overshoot? Or would it be better to use a two-step program with Full ramp for the first and slower ramp for the second?

The answer is to program two segments.

Segment 1: Full rate to 1400°F.

Segment 2: Rate 400°F to the desired temperature.

(Later from the customer: Yes! I programmed the second segment at a rate of 400°F, and it worked like a charm. I don't think it went over target by more than 3 degrees—much better than 30 degrees!)

I anneal glass beads. I program segment 1 to 940°F with a 4-hour hold. When my bead session is finished, I skip to segment 2. Can I program segment 2 with the same 940°F target temperature as segment 1?



If you open the lid for a moment to lower the temperature, it will go back up a little after you close the lid, even if the elements are off. This is called temperature rebound.



If a glass program has too many segments, you can often combine several segments and still achieve the same firing results.

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I assume you need 2 segments because you want your beads to soak for a certain period, perhaps 30 minutes, at 940°F after you skip to segment 2. Yes, you can program duplicate target temperatures in consecutive segments. Orton controllers made before 2006, however, have a problem with duplicate consecutive target temperatures. Changing one of the consecutive target temperatures by just 1 degree, however, will correct the problem.

I have programmed a segment for flash venting, which takes the kiln down to the annealing range. I open the kiln to lower the temperature, but when I close the lid, the temperature goes up.

If you flash-cool the kiln by raising the lid, the rate for that segment of the firing should be Full. If you have programmed a slow rate, the kiln will heat back up in an attempt to slow down the cooling rate that you programmed. Another possibility is that the elements turned back on, because the temperature dropped into the next segment that had a slower cooling rate. Or the controller was still firing the previous segment, which did not have a Full rate. Also, kilns are subject to temperature rebound. If you open the lid for a moment to lower the temperature, the temperature will go back up a little after you close the lid, even if the elements are off.

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Arnold Howard writes instruction manuals and advertisements for Paragon Industries, L.P. His hobbies are glass fusing and karate. He also enjoys studying history and watching classic movies. You can reach Arnold at ahoward@paragonweb.com with questions for future columns. Visit www.paragonweb.com to sign up for his kiln newsletter.

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