
# To Peek or Not to Peek

## We once had to peek

Although glass artisans had been melting glass for centuries the true birth of kilnforming came from stained glass artisans wondering if there wasn't some way to use the piles of scraps they have left from cutting out shapes to make lamps and windows.

They didn't know what temperatures and hold times produced different results and didn't have electronic controllers to regulate the temperature their kiln fired to. They only had pottery kilns that used ceramic cones engineered to turn the kiln off at a specific temperature. The only way they could tell it their glass project had slumped as much as they wanted or fused as much as they wanted was to look. They would open the lid and look or could pull out one of the vent plugs and peep inside the kiln to look. Many artisans would take care to set the level of the kiln shelf and position the project on it to be easy to see through the vent plug hole.

With experimentation looking at they project and checking the temperature reading on the kiln pyrometer they learned what temperature would produce a slump or a tack fuse or a full fuse.

## Brake Factor

When the kiln is turned off there is still some residual heat in the kiln that continues to affect what happens to the glass. It doesn't stop as soon as the power is turned off. It's like when you're driving a car and step on the brakes. You don't stop the instant you hit the brakes. The car keeps moving. How far it keeps moving depends on how fast you were traveling. The same when you have a glass project firing in your kiln. When you turn the kiln off, the residual heat continues to affect the glass. The higher the temperature in the kiln, the longer the residual heat will continue to affect what happens to the glass.

Just as when driving a car you have to allow time to come to a full start, you also must do the same when deciding when to turn off the heat in your kiln.

## Experimentation

Glass artisans tried different temperatures and hold times and learned that temperatures and times produced different results. They kept records of what happened. From those record they created firing schedules to be used to repeat results.


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## Cones are Unpredictable

Even with careful record keeping from repeated experiments it was not possible to get consistently repeated results. The problem with cones is they are only accurate to about 100°F. You might have selected a cone for 1350°F hoping for a tack fuse firing but the error factor could have the kiln fire as high as 1450°F for a full fuse or only 1250°F for a slump. Firing with cones could only provide an approximate temperature.

## Reasons to Peek

- A project never tried before – you don't know what the firing schedule should be.
- Too many variables. A project like a drop that has too many variables for you to determine the right firing schedule.
- Spot displacement. If you peek before the top performance temperature you can see if
- something has shifted so you can correct it before the firing is complete.

## Reason to Not Peek

- Unnecessary. If you have and electronic controller you can program it to do what is needed.
- Becomes a crutch. Relying on peeking removes the need to learn enough about how glass responds to heat to be able to calculate predictable firing schedules.
- Creates variability. Stopping the kiln does not stop the process. It requires you estimate how much the residual heat in the glass continues the process.
- Reaching into a hot kiln to readjust a project is needlessly dangerous.

## When is it safe to peek?

Anytime. If the temperature in the kiln is above 1000°F (540°C) you can fully open the kiln and have a good look. You can even reach in and manually manipulate the glass if you wish. Just be sure you close the lid before the temperature drops too far. If you only crack the lid a little and peek on a few seconds you can do it at any temperature. The same if you peep through the vent plug hole.

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Just a quick look

Shining a pen light into the vent plug hole to peep inside.


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## Electronic Controllers

The reason we now have electronic controllers is to avoid the need to look. We have them because glass artisans bitched and sniveled to the kiln makers to convince them to install controllers to end the need to look. Where pottery ones were only accurate to about 100°F, the electronic controllers we use now are accurate to 1F and 1 min time. There way still be projects where you need to look but we will all very soon have cameras installed inside our kilns. Instead of lifting the lid or peeking through vent hole, we will phone our kiln and look inside to what is happening.

## Look to Learn

The objective should be to learn from what happened and use what you learned to create predictability. You look to learn so you will not have to look next time. You keep careful records of what happened at different temperatures and how long it takes for it to happen. You use what you learned to create firing schedules that are predictable.

It's like cooking a roast. If you have never cooked one before, and didn't have access to any references on recipes for cooking a roast, you could put it the oven and let it cook for a while then open the oven door and reach in and cut into it to see how much it has cooked. Keep repeating that until your roast was cooked as much as you want it to be. After a number of experiments you would learn that how long it takes to cook a roast depends on how big it is and how well you want it cooked. You then no longer have to open the oven to check. Just leave it in the oven for as long as it takes to cook.