



Firing Guide

A basic guide to kiln-firing System 96® products

These pages contain guidelines for Fusing and Slumping 12-inch (30cm) projects of various thicknesses, using the System 96 family of Tested-Compatible products. These are guidelines, not strict rules. Times and temperatures will vary with equipment and project size. We've also included an instructive Forming Stages chart, basic technical data and other information to assist you in understanding how System 96 products behave during the kilnforming process. Check system96.com for more detailed information on firing larger projects.

For 4-segment firing: Eliminate Segments 2 and 6 by simply continuing your Segment 1 rate to fusing or slumping temperature. Stop firing after Segment 5, allowing your kiln to cool at its natural rate (door closed, power off) to room temperature.

FAHRENHEIT	Segment	Thickness	Rate	Temp	Hold
		(inches)	(°F per hour)	°F	Minutes
FUSING Project size: 12-inches	1. Heating I	1/8	500	1000	0
	Heat from room temp to softening temp	1/4	400		
		3/8	300		
	2. Heating II	1/8	1000	1465	Desired effect
	Heat to fusing temp	1/4			
		3/8			
	3. Cool to Anneal	1/8	As fast as possible	1000	5
	Cool down to anneal zone and equalize kiln temp	1/4			8
		3/8			10
	4. Anneal I	1/8	600	950	10
	Ease down to anneal point and hold	1/4	300		20
		3/8	200		40
	5. Anneal II	1/8	300	800	0
	Slow cool through strain zone	1/4	200		
		3/8	100		
	6. Cool Down	1/8	800	120	0
	To room temperature	1/4	400		
		3/8	300		

Technical Data	Strain Point*	Anneal Point*	Softening Point
Fahrenheit:	890 (+/- 10)	955 (+/- 10)	1255 (+/- 10)
Celsius:	476 (+/- 12)	513 (+/- 12)	680 (+/- 12)

* At the Anneal Point of a glass, internal stresses are largely relieved in a matter of minutes. At the Strain Point, internal stresses are substantially relieved in a matter of hours.

Segment	Thickness	Rate	Temp	Hold
	(inches)	(°F per hour)	°F	Minutes
1. Heating I	1/8	500	1000	0
Heat from room temp to softening temp	1/4	400		
	3/8	300		
2. Heating II	1/8	1200	1225	Desired effect
Heat to fusing temp	1/4			
	3/8			
3. Cool to Anneal	1/8	As fast as possible	1000	5
Cool down to anneal zone and equalize kiln temp	1/4			8
	3/8			10
4. Anneal I	1/8	600	950	10
Ease down to anneal point and hold	1/4	300		20
	3/8	200		40
5. Anneal II	1/8	300	800	0
Slow cool through strain zone	1/4	200		
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6. Cool Down	1/8	800	120	0
To room temperature	1/4	400		
	3/8	300		

FAHRENHEIT

SLUMPING Project size: 12-inches

Annealing	Simple Advice for Thorough Annealing
	<p>Different colors have different “ideal” annealing temperatures. Generally, opals tend to anneal best several degrees lower than transparents, and hot colors (reds & oranges) are best annealed lower than opals. Most all of System 96 glasses have ideal annealing temperatures between 965°F (518C) and 940°F (504C).</p> <p>Annealing will still occur if you hold 20-30° above or below the ideal temperature; it just takes more time. The further away you are from the “ideal” temperature, the longer it takes to get a good anneal. If you hold at a temperature which is <i>too far</i> away from the ideal anneal temperature (say, 40° or more) you may never sufficiently relieve the internal stresses. It is also important to ramp slowly down from the anneal point to the strain point. If the temperature throughout the project is not very similar, it is possible to create permanent stress.</p> <p>To assure a good anneal, we recommend holding at 950°F (510C), then slowly ramp down (around 150° per hour) to 800°F (427C) Holding time and ramp speed depend on how big and thick your project is. Refer to Firing Schedules for guidelines.</p>

Bubble Squeeze	Guidelines for Controlling Bubbles
	<p>If you’re seeking to reduce or eliminate bubbles, try slowing the rate of heating in Segment #2 (Heating II). Inserting a half-hour soak at around 1220° F (660°C) may also help, allowing added time for air to escape from between glass pieces before the edges seal and trap it in the form of bubbles. For large projects, experiment with a “ramp squeeze,” a very slow ramp to tack temperatures, say 60° per hour from 1100-1300°F (590-704°C). If your project has a clear base, consider using our “Double Thick” clear instead of two layers of regular clear. You can’t trap air where there isn’t a space.</p>