

## Torch Work Celsius Annealing Guidelines 3mm-76mm Thick Solid Work

CELSIUS FIRING SCHEDULE (Ramps for work on mandrels in open air)								
HEATING			ANNEALING AND COOLING					
Step 1*			Step 2	Step 3		Step 4		
Target Temps >>	516° C		510°C	427°C		38° C		
Max Thickness in thickest dimension	Ramp (Rate /Hr)	Minimum Hold (Minutes)	Hold (Minutes)	Ramp (Rate /Hr)	Hold (Minutes)	Ramp (Rate /Hr)	Hold (Minutes)	Min Time (hours) (Steps 2, 3 & 4)
12mm	166° C	15	30	28° C	0	166°C	0	7.6
25mm	166° C	15	60	56° C	0	111°C	0	9.4
38mm	166° C	15	120	28° C	0	56°C	0	15.5
51mm	166° C	15	160	14° C	0	28°C	0	26.3
63mm	166° C	15	200	10° C	0	20°C	0	32.1

\*This loading hold temperature works for typical bead kilns with small doors. Kilns with larger doors allow more cooling when the door is opened. In this case, use a higher Step 1 temperature (for example, 538° C) but always start Step 2, the pre-annealing soak, at 516° C.

FIRING STEP DEFINITIONS /OBJECTIVES	
<b>Step 1</b>	Heat glass, small pre-made components & kiln interior to the annealing point or slightly above. Hold through the loading period. If kiln is empty during heat up, heating AFAP is OK.
<b>Step 2</b>	Pre-annealing soak — after last piece is loaded. Equalizes temperatures throughout glass and kiln.
<b>Step 3</b>	Annealing ramp: slow cool through the annealing zone to below the strain point.
<b>Step 4</b>	Cooling ramp. Turn off at end. For work 1inch or thicker, wait to open kiln door until interior is 38°C or room temperature.