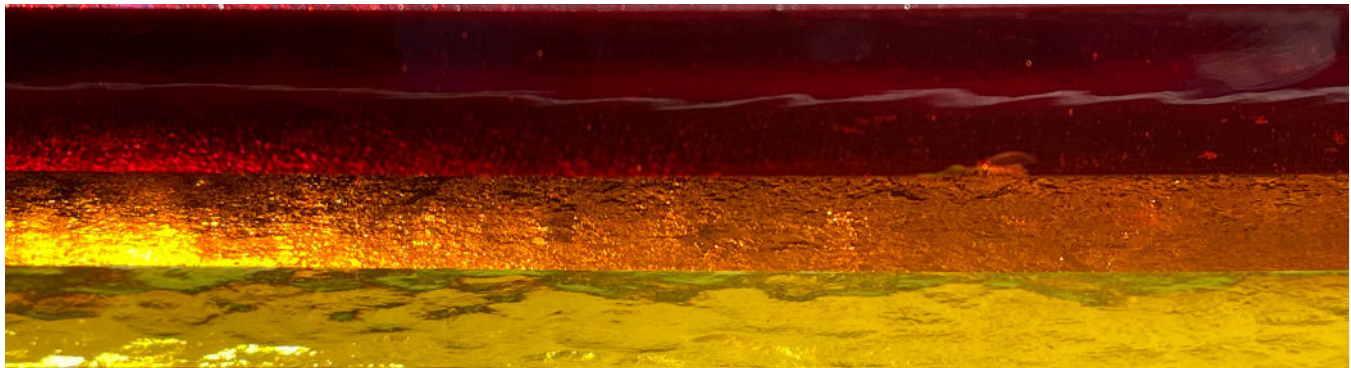


Ⓢ Heatwork & Cadmium-Bearing Glass



Bullseye's red, orange, and yellow-hued glass styles contain the element, cadmium, which tends to be more sensitive to heatwork than other colorants. This document explores how to work successfully with Bullseye's cadmium-bearing glass styles.

Heatwork within Bullseye's Tested-Compatible Range

Bullseye tests all cadmium-bearing glasses within its fusible (Grade-F) glass styles to guarantee they will withstand up to three firings at 1500 °F (815 °C) with 15-minute soaks before annealing. Within that tested-compatible, triple-fired range, you can fuse these glasses successfully without giving it a second thought.

Heatwork Beyond the Guaranteed Range

Many of our glass styles can withstand soaks longer than 15 minutes and far more than three firings. Artists and makers within our community do so all the time with wonderful results. But when venturing beyond Bullseye's tested heatwork parameters, the only way to ensure consistent success is to conduct your own testing.

If your firings take the glass outside the parameters of our test for compatibility, you'll want to test all the glasses you intend to use through all the firing schedules you intend to use (basic steps below). This is especially true when using cadmium-bearing glasses. Generally speaking, these are more prone to shifts in color and compatibility than other glass styles. So before firing beyond tested limits, it is helpful to familiarize yourself with our cadmium-bearing glasses (list on the reverse page) and to keep in mind a simple guideline:

When firing any glass beyond the tested-compatible range, it is essential to conduct tests—and this is especially true when using cadmium-bearing glass(es).

Testing for Specific Conditions

1. Determine all glass styles to be used in your project.
2. Determine precise firing schedules for the project's full range of heatwork.
3. Make sure test pieces share the same production date as the glass to be used for your project.

4. Create test samples for each glass style/production date.
5. Fire the samples using the project's intended firing schedules and full range of heatwork.
6. Observe what works, what doesn't, and take meticulous notes.
7. If the transparent cadmium glass(es) that you test opalize, that's a sign that they are also shifting in compatibility characteristics, and you are advised to change the process or use glass(es) from a different production date.

A Cautionary Example: Bubble Squeezes







































Because many of our glasses remain stable well beyond their tested limits, it can be easy to mistake some low-temperature processes as falling within the risk-free range. Take performing a bubble squeeze, as an example. During a first full-fuse firing with layers of sheet glass, it often makes sense to hold at 1225 °F (663 °C) for 30–120 minutes to prevent large unwanted bubbles. If subsequent firings rotely repeat that hold, however, it may prove detrimental. The color quality and compatibility characteristics of cadmium-bearing glass can degrade over the course of multiple firings when held too long at a bubble squeeze temperature of 1225 °F (663 °C). It is possible, then, for processes that benefit a project during a first firing to begin undermining it when repeated. Again, testing is the best way to make such discoveries and fine tune your processes.


Tips for Minimizing Overall Heatwork

1. Whenever possible, avoid longer bubble squeeze holds. (Shorten or omit them as your project allows.)
2. Add cadmium-bearing styles in later firings.

Cadmium-Bearing Glass Styles

This list encompasses all forms of these glasses: sheet, frit, rod, etc. Be aware that some color mix styles may include one or more styles from the list.

	000024	Tomato Red Opal		001025	Light Orange
	000025	Tangerine Orange Opal		001119	Sienna
	000120	Canary Yellow Opal		001120	Yellow
	000124	Red Opal		001122	Red
	000125	Orange Opal		001125	Orange
	000126	Spring Green Opal		001126	Chartreuse
	000203	Woodland Brown Opal		001320	Marigold Yellow
	000220	Sunflower Yellow Opal		001321	Carnelian
	000221	Citronelle Opal		001322	Garnet Red
	000222	Avocado Green Opal		001422	Lemon Lime Green
	000224	Deep Red Opal		002020	Clear, Sunflower Yellow Opal
	000225	Pimento Red Opal		002024	Clear, Red Opal
	000227	Golden Green Opal		002026	Clear, Spring Green Opal
	000309	Cinnabar Opal		002121	Yellow, Deep Forest Green
	000310	Umber Opal		002123	White, Orange Opal
	000320	Marigold Yellow Opal		002124	Red Opal, White
	000321	Pumpkin Orange Opal		002125	Yellow, Red
	000329	Burnt Orange Opal		003123	White, Orange Opal, Deep Forest Green
	000337	Butterscotch Opal		003203	Woodland Brown Opal, Ivory, Black

 This style may not reveal (or strike to) its target color until fired.