

MAKE IT: Dilution Solution

Glass

2 sheets:

- White, 3mm, 10" x 10"
(000113-0030-F)

1 sheet each:

- Sea Blue, 3mm, 10" x 10"
(001444-0030-F)
- Khaki, 3mm, 10" x 10"
(001439-0030-F)
- Tekta, 4mm, 5" x 10"
(001100-0480-F)

1 piece:

- Clear rod, 7–9mm
(001101-0876)

Produces one 9" x 9", two 5" x 5", and two 4" x 4" finished pieces, with clear rod and sheet left over for future projects.

Tools

- Basic glass cutting tools
- Neo GC Cutter (7162)
- Slumping Mold (8634)
- Slumping Mold (8997)
- Slumping Mold (8636)

Non-glass Consumables

- Shelf primer, ThinFire, or shelf paper

Other Handy Items

- GlasTac
- Tweezers
- Ultra Fine Point Sharpie pen
- 120 grit diamond pad
- Scotch-Brite Heavy Duty Scour Pad

Professional-style Options

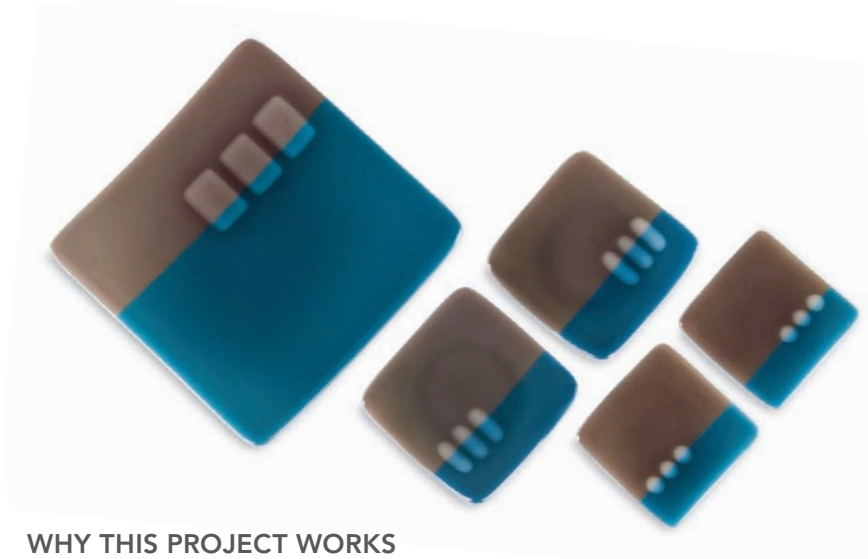
- Coldworking equipment/grinder/belt sander

Recommended Reading

- Glass Cleaning Basics
- Improve Your Glass Cutting
- TechNotes 5: Volume & Bubble Control
- TipSheet 7: Platemaking
- Tips for Using Bullseye Slumping Molds

Articles can be found at www.bullseyeglass.com/education

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WHY THIS PROJECT WORKS

Significant amounts of clear sheet and rod are fired over a palette of medium-saturation sheet to displace the material directly underneath. This creates lighter areas by diluting the color to reveal more of the white base layer.

General lay-up: White base, with a cap of Sea Blue and Khaki. Clear design elements form the top-most layer.

PREPARE THE CLEAR DESIGN ELEMENTS

1. 4mm Tekta: Cut three 1" x 1 1/2" pieces.
2. 7-9mm rod: Cut six 1" lengths, looking for a relatively clean break on the ends for similar volume in each piece. In this design, these pieces are fired lengthwise and so are prone to roll if not secured properly. Pro firing-tip: Pre-fire the pieces to create a narrow, flat spot along one side of each. Then no holding agent will be required. Fire the clear rod pieces on a primed kiln shelf with a little space around each one. (See Pre-fire Firing schedule.)
3. 7-9mm rod: You will need six 8mm lengths to place on-end, so select rod-pieces with relatively flat, smooth cross-sections. (Consider cutting a few extra so you can select the best.) Use an Ultra Fine Point Sharpie pen and ruler to mark the 8mm lengths, and cut them. (A Neo GC Cutter works well.)

PREPARE THE SHEET GLASS

See the cutting charts. Following the numbered order of operations will help to ensure an accurate yield of cut pieces for the project. Not depicted: Cut one sheet of White to 9" x 9".

ASSEMBLE THE DESIGNS & FUSE

4. Clean and assemble the 9" x 9" plate on inverted cups or blocks (for easy handling). Starting from the bottom up, place the White sheet glass first (smooth side up), then cap with the larger Sea Blue and Khaki pieces (smooth side up). Ideally, the pieces will be close fitting, with

minimal gaps at the seam. If a flared edge prevents a good seam, use a wet diamond pad to remove a small amount of material, then clean well.

- Working over the seam, arrange the three 4mm clear rectangles. To get the same proportions as the sample, overlap 3/8" of the rectangle over the Sea Blue side. Working with the Sea Blue on the left, the lowest rectangle should be about 1" from the edge and the other rectangles should have about 1/2" between them.
- Clean and assemble the components for the 5" x 5" plates in a similar fashion, looking for a good seam on the top layer. To follow the sample design, arrange three of the 1" sections of 7–9mm Clear rod over the seam with an overlap of about 1/3 over the Khaki. The lowest-most section is about 3/4" from the closest edge. Leave about the thickness of the rod itself between each piece. GlasTac will be useful, especially if rods have not been pre-fired. Wait until GlasTac is set to transfer to a prepared firing surface. If possible, assemble the piece directly on a prepared firing surface.
- Clean and assemble components for the 4" x 4" plates. In the sample, the rod pieces are placed on end (centered over the seam), about 1/2" from an edge, spaced about 1/4" apart.
- Transfer pieces to a prepared kiln shelf.
- Program the kiln, double-check everything and fire the pieces. (See Fuse Firing schedule.)

SLUMP FIRING

- Prior to slumping, address any sharp points or edges with a wet diamond pad. Pro style option: Remove material from the edges/coldwork for a cleaner-looking edge. Note: Separator material (especially primer) is more likely to adhere to opalescent styles than transparent or iridized glasses. Remove residue with a green scrub pad and water.
- Clean the pieces and load them onto (primed) corresponding molds. Elevate molds to promote even heating and cooling.
- Program the kiln, double-check everything and fire the pieces. (See Slump Firing schedule.)

NOTES FOR FUTURE PROJECTS

Using clear glass for dilution and displacement effects has great design potential. Firing clear directly over opalescent glasses creates yet another effect, forming pools of clear with a visually recessed surface design. When exploring this technique, leave space around each clear design element to allow for flow.

SUGGESTED FIRING SCHEDULES

Greater heatwork than our "standard" full fuse gives the top design elements a better chance to fuse deeply into the base layer.

Pre-fire Firing (See Step #2)

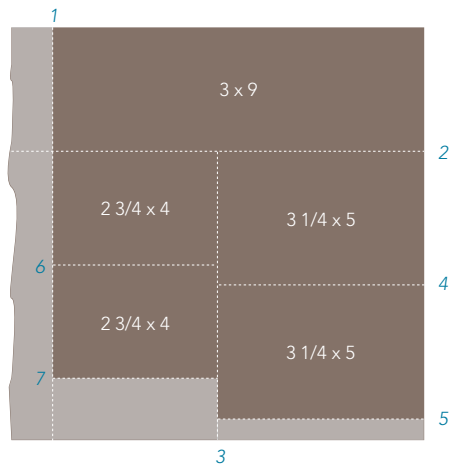
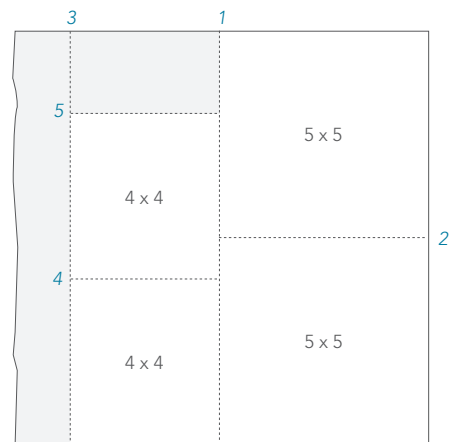
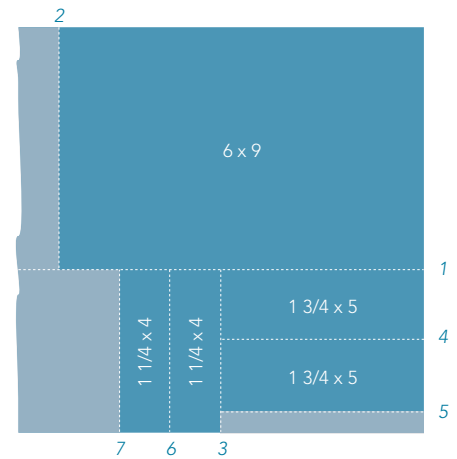
	RATE*	TEMPERATURE	HOLD
1	500°F (278°C)	1350°F (732°C)	:05
2	Vent kiln to cool AFAP.		

Fuse Firing

	RATE*	TEMPERATURE	HOLD
1	300°F (167°C)	1225°F (663°C)	:45
2	600°F (333°C)	1500°F (816°C)	:10
3	AFAP**	900°F (482°C)	1:00
4	100°F (56°C)	700°F (371°C)	:01
5	AFAP**	70°F (21°C)	:01

* Degrees per hour

** AFAP: Allow kiln to cool at its natural rate with the door closed.



Follow this order to cut the smaller pieces of colored glass. From top: Sea Blue, White, and Khaki.

Slump Firing

	RATE*	TEMPERATURE	HOLD
1	300°F (167°C)	1225°F (663°C)	:05
2	AFAP**	900°F (482°C)	1:00
3	100°F (56°C)	700°F (371°C)	:01
4	AFAP**	70°F (21°C)	:00