

# GLASS PATTERNS

— • Q U A R T E R L Y • —

Spring 2022

Volume 38 • No. 1



DIY  
Home Decor,  
Lighting,  
and Wall Art

Fusing and  
Stained Glass

Volume 38 No. 1

\$7.00 U.S. \$8.00 Canada



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16-Page Pattern Sheet**

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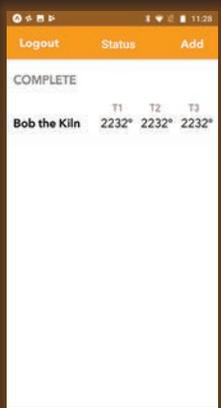
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On the Cover: Cliffside Double Column  
Glass Lamp and Base  
by Alex Spatz.

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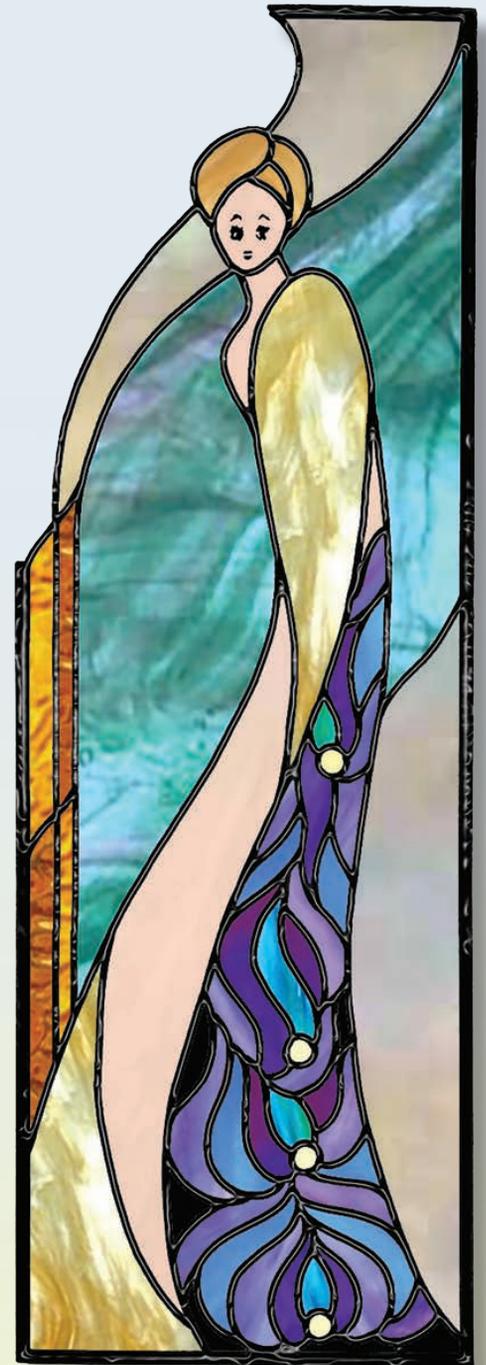
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May 20, 2022

July 20, 2022

July 30, 2022

**Winter 2022**

Editorial

Ad Closing

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**Winter, Wildlife, and Landscapes**

August 20, 2022

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AANP-02

AANP-13



## Bracelets



AANP-08

AANP-09

## Ring



AANP-10



AANP-14

## Pendant (without chain)



AANP-11

## Earrings



AANP-12

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- A. FBM Flat Top  
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 SJBM Medium  
 SJBS Small

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- ITEM# GOLD PLATED**  
 GJBL Large  
 GJBM Medium  
 GJBS Small  
**ITEM# .925 SILVER**  
 925L Large  
 925M Medium  
 925S Small

### Earring Bails



- ITEM# SILVER PLATED**  
 SHBL Large  
 SHBM Medium  
 SHBS Small  
**ITEM# GOLD PLATED**  
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 GHBS Small

### Pattern Bails



- ITEM# SILVER PLATED**  
 A. SPBL-6 Hexagon  
 B. SPBL-H Hashmark  
 C. SPBL-L Leaves  
 D. SPBL-T Tortoise  
 E. SPBL-W Waves  
 SPBL-A Assorted (5 in 1)

### New Design Bails



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 A. SFBS Fish  
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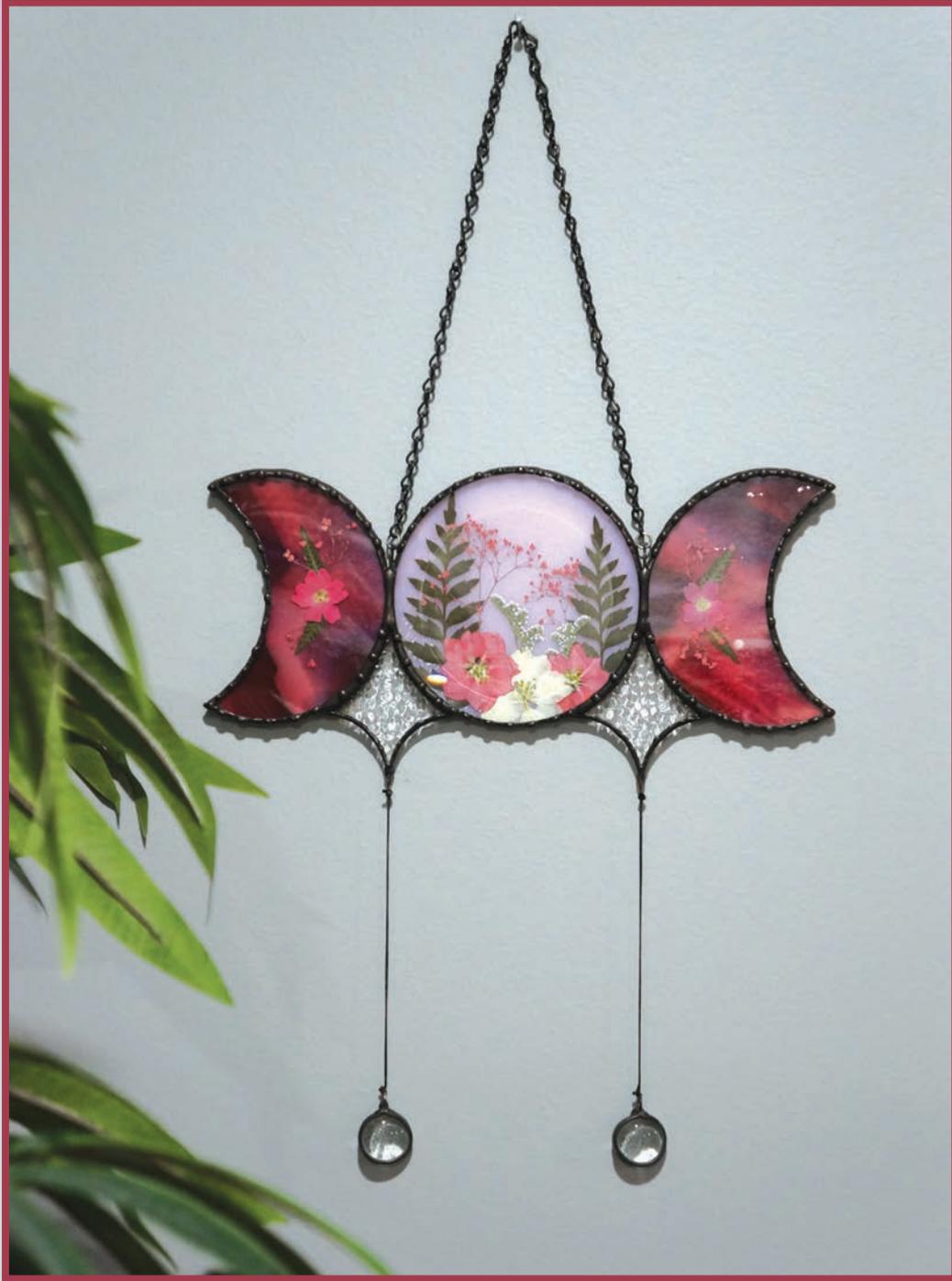
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# Pressed Flower Triple Moon-Phase Design An Introduction to Stained Glass

*Design, Fabrication, and Text by Samantha Ashley*



When springtime arrives once again, the sight of new flowers rising to meet the sun can remind us to look forward to the balmy days of summer as well. When you think of summer, you might think about stargazing on a warm night or the smell of summer

florals surrounding you. The piece I have created captures both ideas by sandwiching pressed flowers between the glass of a triple moon-phase design.

**Wissmach Glass Co.**

01DEW Clear Dew Drop, 4-1/2 x 2-3/4"

**Additional Glass**

Cranberry Pink/White Double Rolled for Half Moons, 6" x 4"

Petal Pink/Opal Double Rolled for Full Moon, 4" x 4"

3/4" Clear Nuggets (2)

4" Clear Round Bevel

Single Strength Clear Glass, 6" x 4"

**Tools and Materials**

Metallic Oil-Based Sharpie® Marker

Hakko FX-60I Soldering Iron

Canfield 60/40 Solder    Classic 100 Gel Flux

Mod Podge®    Paint Brush

3M™ Venture Tape™ 3/8" Black-Backed Copper Foil

18-Gauge Copper Wire    5/64" Hobby Came, 5" Piece

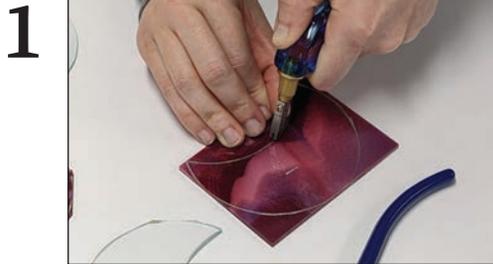
16" Black Jack Chain    Black Waxed Cord

Assorted Pressed Flowers    5 mm Jump Rings (6)

Fid    Microfiber Cloth    Novacan Black Patina

Kwik-Clean®    Clarity Finishing Compound  
Glass Cleaner

Trace the pattern pieces onto the glass, then score and break each glass piece and grind all of the glass edges smooth.



Arrange the pressed flowers on the glass and glue them in place with Mod Podge.



The Mod Podge will not harm the pressed flowers and will keep them from shifting between the glass pieces. After the glue dries, trim any foliage that hangs over the glass edges.

Foil the edges of the three colored phases of the moon and the two clear Dew Drop star shapes.



Firmly hold the pieces of the two single strength Clear/Cranberry Pink glass half moon shapes together that are sandwiching the pressed flowers and foil the perimeter of the glass edges with the 3/8" copper foil. Use a fid to burnish the foil to the glass. Repeat the process with the Clear/Petal Pink Opal full moon shape. Also apply the 7/32" copper foil to the edges of the two Dew Drop glass star shapes and use the fid to burnish the foil to the glass edges.

Solder the moon and star pieces together and prepare the glass nuggets for hanging.

4



Apply flux to the full moon, half moon, and star-shaped glass pieces, then solder them together, making sure to bead all of the edges. You can then add decorative solder beads to the solder lines if you'd like. To prepare the glass nuggets for hanging, wrap each nugget in hobby came and solder the came closed.

Attach the chain and nuggets to the main design.

5

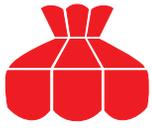


Solder a jump ring to each nugget and the bottoms of the star-shaped pieces. Create two U-shaped hooks with the 18-gauge copper wire and attach them from the front to the back of the solder seams between the half-moon and full moon pieces.

After soldering, clean the piece with the Kwik-Clean Flux Cleaner. You do not want to wash the piece in water, because you'll risk having water seep in between the glass pieces and ruin the pressed flowers. You can choose to leave the piece silver or apply the black patina.

Next, take two 8" pieces of the black waxed cord and attach one to each glass nugget, then to the bottoms of the star-shaped pieces. Attach the jack chain to the top of the design with two jump rings. Solder the jump rings closed so that they can't pull open over time.





# DELPHI

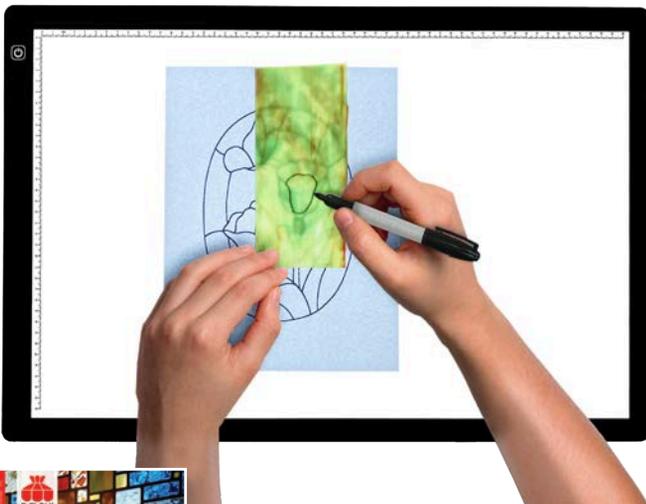
STAINED GLASS FUSING MOSAICS JEWELRY SUPPLIES

## hello SUNSHINE



Artist: Steena Gaut.  
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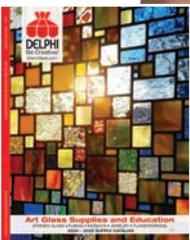
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# 6

Apply a thin layer of Clarity Finishing Compound, let it dry, then buff to a shine with a microfiber cloth.



Now you're ready to hang your piece where you can enjoy your beautiful pressed flower reminder of spring and summer all year long.

GPO

After being introduced to stained glass by her grandfather in 2003, Samantha Ashley knew this would one day be her path in life. She studied mathematics and art at the University of Wisconsin–Madison, graduating in 2010.



Samantha has continued to create stained glass pieces throughout the years, and she eventually launched her business, Samantha Ashley Glass, in July 2020. Her two main inspirations for her work are nature, particularly florals, and Art Deco design. With a strong attention to detail, she takes great pride in the quality of her work and strives for impeccable craftsmanship. Visit Instagram and Facebook @SamanthaAshleyGlass for more of Samantha's glass art.

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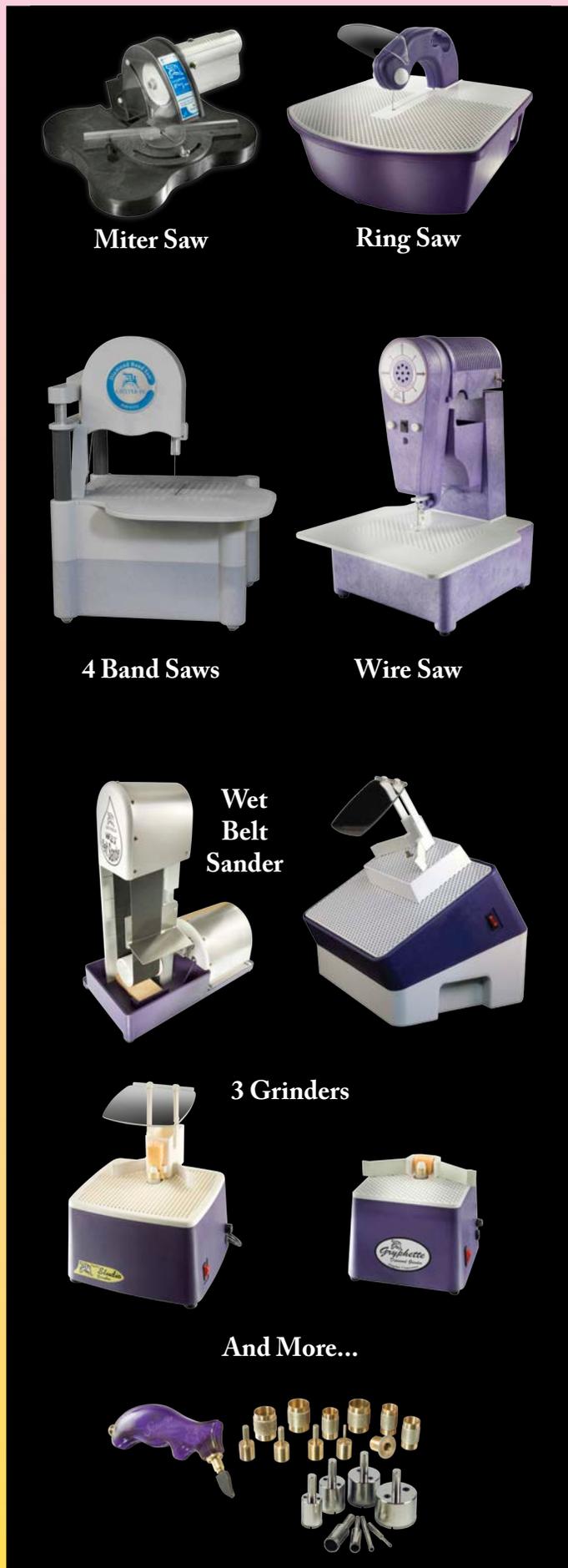
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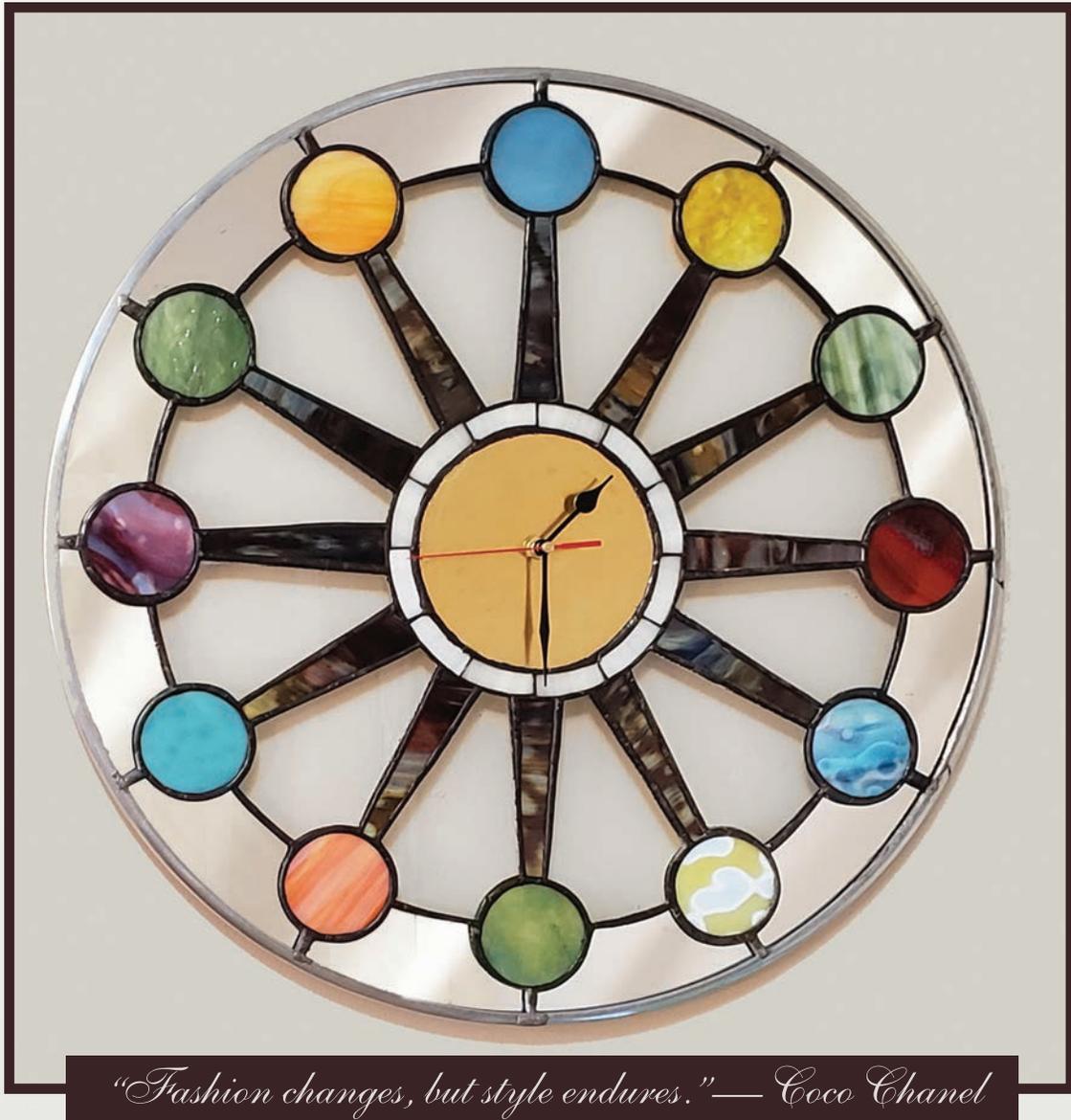


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# Mid-Century Modern Wall Clock

Design, Fabrication, and Text by Chantal Paré



*"Fashion changes, but style endures." — Coco Chanel*

Mid-Century Modern (MCM) designs are making an extraordinary comeback. To celebrate this revival, our tutorial will feature an iconic emblem from that era. In remembering the sleek modernism of the 1950s with its Scandinavian design, teak and walnut furniture with splayed legs, and strong horizontal lines, the once-ubiquitous sunburst clocks are sure to be at the forefront.

In creating this design, I strove to remain as authentic as possible to the canonical MCM style, which dictates that the clocks be made of wood and metal. This creates a challenge, since we are working in stained glass.

Resisting the urge to make the glass look like something it is not, I chose to go in the opposite direction and emphasize its "glassiness" through the use of transparent float glass and mirrored glass. The float glass causes shadows on the wall behind it that make the rays "pop" like a three-dimensional element within the design. The mirrored rim creates ever-changing reflections reminiscent of the chrome that was popular at the time. A selection of MCM-era colors are featured in the twelve circles marking the hours—mustard yellow, tangerine, olive green, teal, and blood red.

This tutorial demonstrates the fabrication of a plain brass clock face, but the pattern can easily be modified to accommodate alternatives such as using glass rather than brass or a numbered clock face, which will require additional rigid backing.

Clock mechanisms are easily found on the Internet or online auction sites. There are several hand designs and types of mechanisms to choose from including a silent, sweeping second hand or the more traditional jerky movement with the familiar tick-tock sound. Choose hands for a 5" dial. Standard threaded shafts or spindles are 5/16", but the smaller 3/16" will work too.

**Youghiogeny Glass Co.**

4302 HS Avocado Green Opal/White/Chocolate Brown  
High Strike for Radiating Arms 1 Sq. Ft.

**Additional Glass**

Almond White for Clock Dial Border, 1 Sq. Ft.

3 mm Clear Float Glass for Background, 3 Sq. Ft.

3 mm Mirror for Outer Border, 2 Sq. Ft.

Orange, Mustard, Teal, Blood Red, and Olive Green  
for Hour Markers, Scrap

**Tools and Materials**

Brass Metal Sheet Plate 0.8 mm x 200 mm x 200 mm

Clock Mechanism with 5" Clock Hands

3/16" or 5/16" Clock Post Permanent Marker

Glass Grinder 1/4" Zinc Came Flux

60/40 Solder 7/32" and 3/16" Black-Backed Copper Foil

Black Nail Polish Aviation Snips Metal File

Drills and Drill Bits up to 13/32" (approximately 10 mm)

Painter's Masking Tape Wax Paper C-Type Clamp

Whiting Burnishing Brush Felt Cushioning

Pretinned 14-Gauge Copper Wire

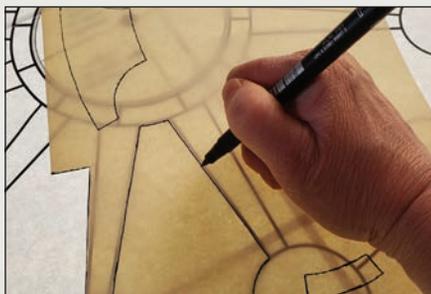
Black Patina for Lead Flux/Patina Neutralizer

Car Wax Small Round Felt Cushions

Pressure Roller 10-Pound Rated Hanging Hook

1

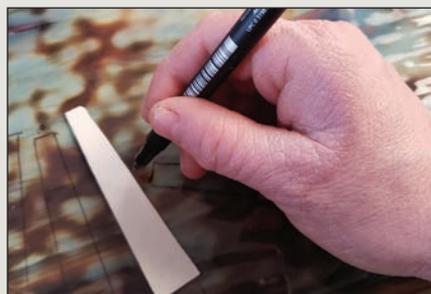
Prepare a copy of the pattern.



This is a symmetrical pattern based on a 12-fold repeat. Using sturdy paper, trace one shape in the pattern to use as a template multiple times and cut it out with ordinary scissors.

2

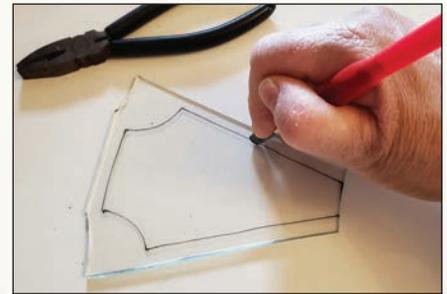
Trace the pattern pieces onto the glass.



Lay down the pattern pieces on the appropriate glass color and trace each one with a permanent marker.

3

Score and break the glass pieces on the inside of the marker lines.



4

Grind away any leftover black marker lines and double-check that your pieces fit on the pattern.



5

Seal the edges of the mirror's silver back with black nail polish to prevent future "mirror rot" or desilvering.



6

Foil the glass pieces.



Foil the cream colored clock dial border pieces with 3/16" foil to ensure fine lead lines around the clock dial. Foil all of the other pieces using 7/32" black-backed copper foil for sturdier lines everywhere else.

7

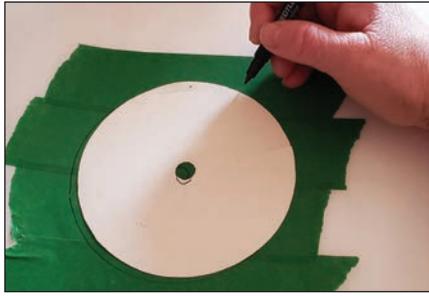
Trace the inner clock face onto the brass sheet plate and cut with aviation snips.



Cutting with the tip of the snips will give you greater control around the curvature. Remove any irregularities with a metal file.

8  
Cut out the resist outline and center hole and apply to the brass dial.

8



Stagger enough pieces of painter's masking tape on wax paper to fit the resist outline template piece on the pattern. Trace the resist outline onto the masking tape as indicated on the pattern and cut out the resist outline, including the 10 mm-diameter center hole. Next, stick on the brass dial. It may take a few tries to get it properly centered.

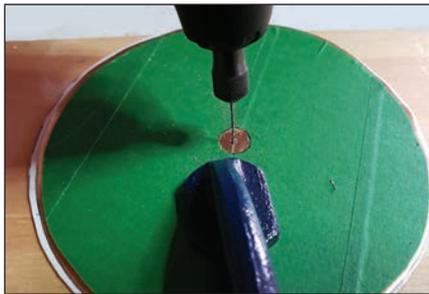
9  
Secure the brass dial over a piece of scrap wood with a C-type clamp.

9



10  
Drill a tiny hole with your smallest drill bit at the center of the dial.

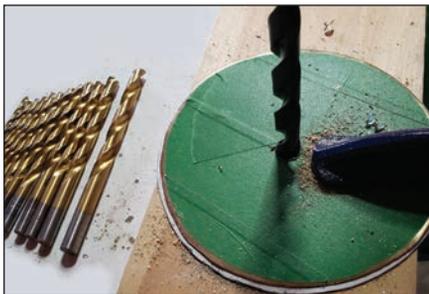
10



A Dremel drill is ideal for this.

11  
Use increasingly wider drill bits to gradually enlarge the hole until it is 13/32" in diameter (approximately 10 mm).

11



12  
Tack-solder the pieces.

12



Place your glass pieces face down on the pattern. This is important for the thinner clock face to be flush with the front of the project. Lightly flux the pieces and drop a bit of solder to tack-solder the mirror pieces together to stabilize the project boundaries, ensuring that each piece is precisely centered within the boundaries of its place on the pattern. Tack-solder the float glass to the mirror rim, then tack-solder the rest of the pieces together.

13  
Solder and bead the clock.

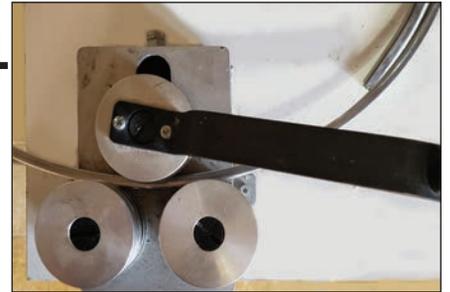
13



One small area at a time, brush flux onto the copper foil and solder the pieces together taking care to make a nice bead over each line. Turn the project over and fully solder the other side. Leave some space around the edges of the project free of solder to be able to slip on the zinc frame later.

14  
Bend the zinc came with the pressure roller to form a circular frame.

14



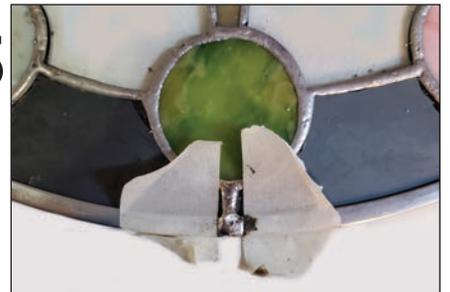
Insert the came in the bottom groove of the two follower rollers with the open side of the came away from you. Using the side crank, bring the pressure roller forward to insure a snug fit. With the top crank, roll the whole length of the came back and forth one time.

Repeat several times, each time bringing the pressure roller forward a little bit more. A small increment in pressure can make a large change in curvature, so proceed very gradually until the curvature matches that of the pattern outline.

Be careful not to overshoot the curvature, since curves cannot be easily reversed. With a hacksaw, remove the unbent extremities of the came strip.

15  
Apply the frame to the clock.

15

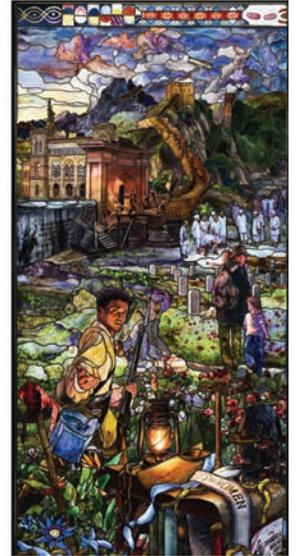
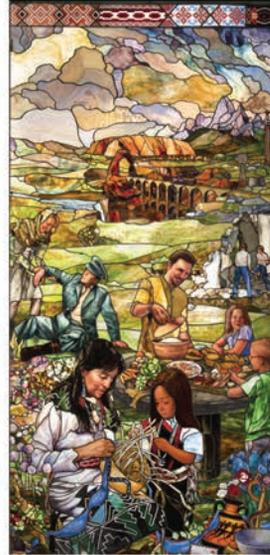
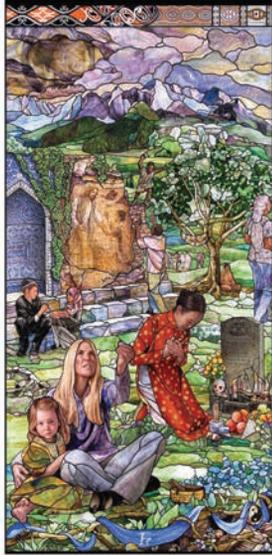


Wrap the came around the project, mark where one end meets the rest around the circumference, and cut. Align the point where the ends of the came meet to the desired 6 o'clock position on the clock.

Using masking tape as resist, solder where the ends of the came meet, then tack every ray where it abuts the came on both sides.

# Youghioghney Opalescent Glass Company, Inc.

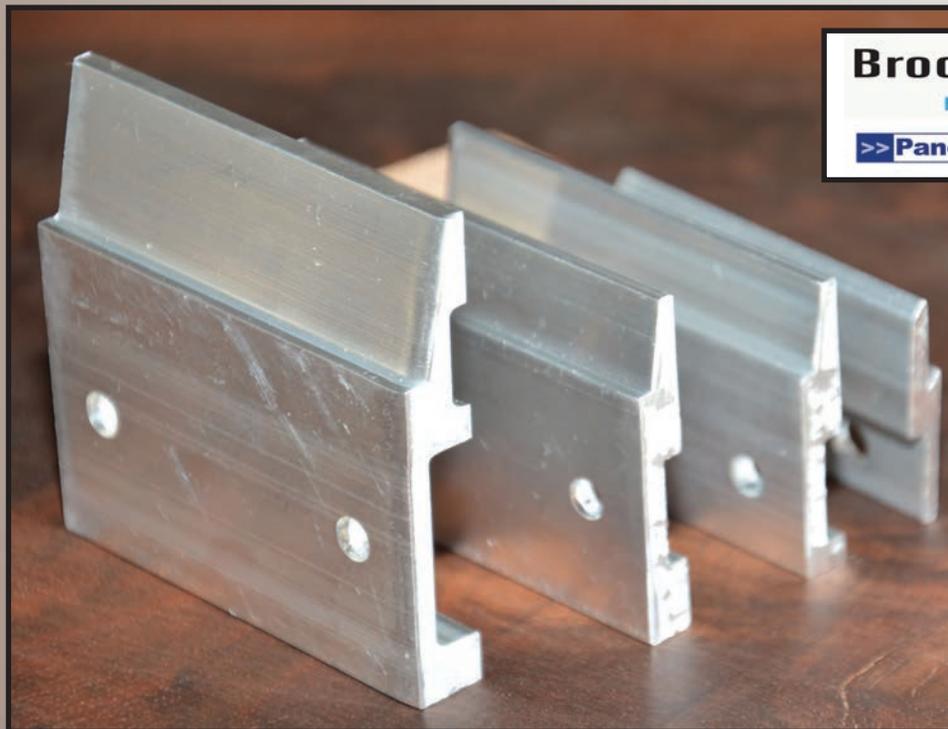
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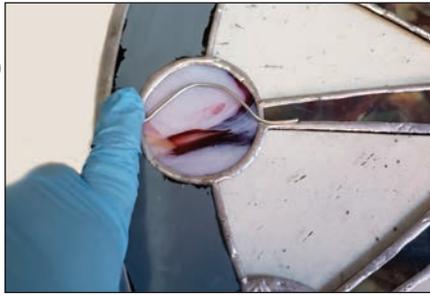
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# 16

Bend some pretinned copper wire to form wide hooks at the 3 and 9 o'clock positions.



# 17

Attach the hanging hooks.



Secure the hooks on the back of the clock with abundant solder on the lead line that leads to the zinc came and the lead line at the bottom of the adjoining sunburst ray.

# 18

Polish the lead by vigorously brushing with a burnishing brush and some whiting.



# 19

Patina the lead and clean.



Protect the zinc frame with masking tape before applying the patina. Simply pour one teaspoon at a time directly onto the project over small areas and spread it with a gloved hand.

Pat the excess patina solution with a paper towel and remove the masking tape resist on the zinc frame. Wash off the clock with patina and flux neutralizer, then with soap and abundant water.

# 20

Polish the clock.



Remove any remaining masking tape resist on the zinc and the brass center. Polish the entire clock with car wax, especially the zinc frame, to prevent oxidation.

# 21

Place the rubber gasket on the clock mechanism.



# 22

Install the clock mechanism.



Pass the clock mechanism shaft through the brass dial. Place the washer and firmly screw on the hex nut, making sure that the place for the battery is perpendicular to the 6 o'clock ray and at the bottom of the mechanism. Fasten the mechanism in the back with tape or hot glue, with just enough to be able to easily remove and replace the mechanism should it ever break.

Push the hour hand into the shaft, followed by the minute hand, both in the noon position. Screw on the cap nut or the second hand depending on the material you are using. Install the battery and set the correct time using the wheel in the back of the clock mechanism.

Using a level, make two marks 16" apart on the wall where you want the clock. The center of the clock will line up with the center of the marks. Nail a 10-pound-rated hook above the marks.

# 24

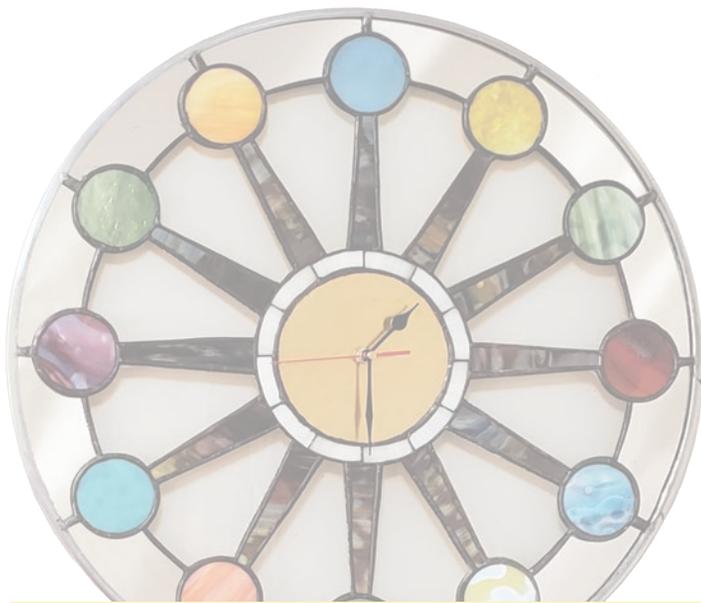
Add the felt cushions to protect the wall and plumb the clock.



Stack up the kind of felt cushions that are used on the bottoms of furniture legs at the 6 o'clock position so that every point on the clock is equidistant from the wall. The clock should now be perfectly parallel to the wall and ready to keep you on time for all of your important gatherings.

**GPQ**

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Two decades ago, Chantal Paré quit the fast-paced world of molecular biology to devote herself to the full-time pursuit of glass. She's liable to melt it, blow it, break it, paint it, or cast it, sometimes just to show it who's boss. Nothing else comes close to creating an object through which light can pass the same way it does through water.



Lately, Chantal is concentrating her efforts in glass painting. In her free time, she also draws and self-publishes patterns in a variety of styles ranging from Victorian to geometric that are available at [www.free-stainedglasspatterns.com](http://www.free-stainedglasspatterns.com).

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# Cliffside Double Column Glass Lamp Base

*Design, Fabrication, and Text by Alex Spatz*



In the past, Cliffside Studio offered a wooden double column lamp base for its 5200 series 12" x 18" Prairie Design rectangular lampshades, which may be the only rectangular lampshades in the stained glass industry. As the popularity of Prairie lamps faded, the wooden base was dropped. However, Cliffside studio has expanded its line of 5200 series designs to include Prairie and Contemporary designs. Since a lamp base is needed for those lamp shades, Cliffside Studio is providing a free double column glass base pattern on the company's website, [www.cliffsidestudio.com](http://www.cliffsidestudio.com), that is patterned on the wooden base formerly carried in the company's line.

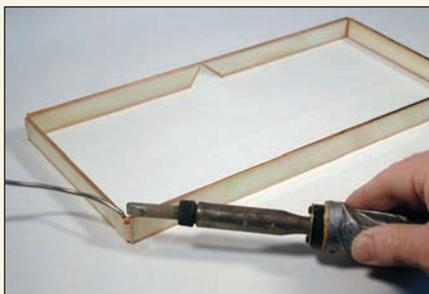
**Wissmach Glass Co.**  
 9976-58l Amber/White Iridized, 15" x 20"  
**Tools and Materials**  
 39" Rebar  
 39" Brass or Zinc U-Channel Came  
 3" or Shorter Brass Bar  
 1" Nipple  
 2 Brass Knurled Nuts  
 1 Light Socket and Power Cord  
 Carpenter's Square  
 7" Harp

### Assembling the Parts

To begin, trace the pattern pieces onto the glass, then cut and foil the glass. Cut and foil all the parts of the base except the rectangle between the columns. Measure and cut this piece after all of the other parts have been assembled to be sure that the piece will fit the space between the columns once they are installed in the base.

1

Assemble the bottom parts of the lamp base.



Tape the bottom parts of the lamp base together, then tack-solder the corners together along with the back section where the opening for the electrical cord is located.

2

Tape the beveled parts together and tack-solder the corners.



3

Attach the bottom section to the beveled section.



Turn the beveled section upside down and place the bottom over it, lining up the corners. Tape them together and tack-solder the corners, then solder the joints.

4

Lay out the sides of the columns and tape them in place, leaving space for the thickness of the glass.



5

Set up the 4 sides, lining them up corner to corner, and tack-solder.



6

Solder the sides of the columns.



A stand can be made to solder the sides of the columns using a cardboard box with a V cut in each end, one cut lower than the other.

7

Measure and mark the center of the top of the column.



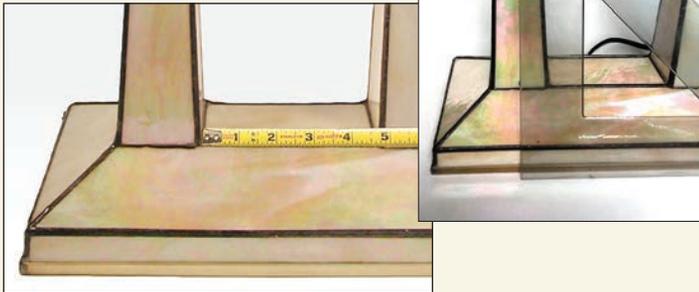
8

Measure and mark the center of the bottom of the column.



Using a square, line up the marks at the top and bottom of the columns and solder them in place.

9



Make sure that the columns are lined up and straight before soldering them to the beveled section of the base. Measure and cut the piece of glass that goes between the columns last to make sure it will fit that space.

### Attaching the Electric Parts

Cut 2 sections of rebar and solder them to the columns, then a piece of brass bar to the center of the rebar.

10



Be sure to solder them to the side beads of the columns for strength. Next, cut down a brass bar to the width of the pair of rebar sections and solder it in the center of the rebar.

11

Run the electric cord up through one of the columns and connect it to a socket and harp.



### Attaching the Crossbars

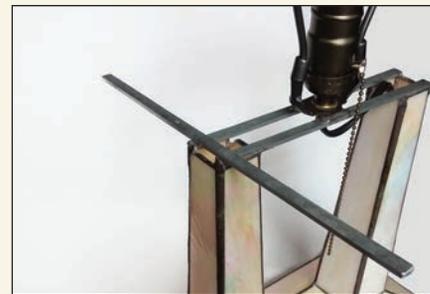
Crossbars are necessary to keep the lampshade parallel with the base, otherwise the lampshade can spin on the harp. In this case, I've used rebar as the crossbars.

12

Measure the inside width of the lampshade while it is on the base, then cut the rebar to size and file the ends smooth.



13



Center the crossbars on the glass column and solder in place.



Finish the bottom of the base with 1/4" brass or zinc U-channel for appearance and to provide a firm foundation for the base.

GPO

Alex Spatz learned the stained glass craft while he was in college pursuing a degree in Studio Art. After college, he worked in the Decorative Accessories industry as a product designer of decorative mirrors. In 1991 while employed by Dale Tiffany, Inc., a stained glass lighting manufacturer, he designed a series of Prairie style lamps, which required research into the work of famed American architect Frank Lloyd Wright.

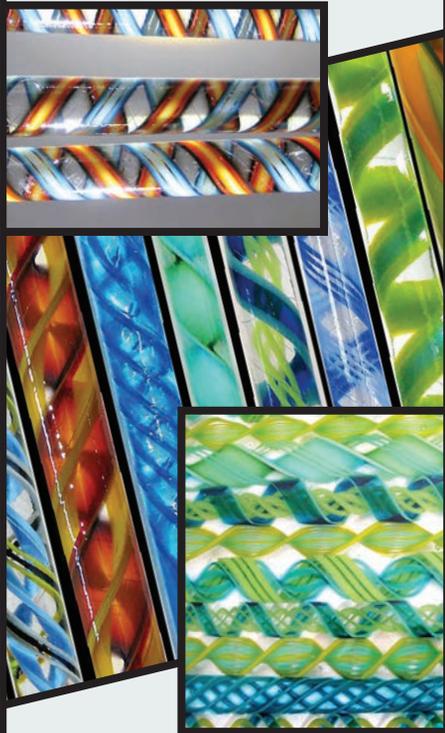


Captivated by Wright's work, Alex began publishing Prairie style stained glass design books in 1993, as well as books for photo frames and lamps. Since then, Cliffside Studio, his publishing company, has added patterns for rectangular and octagonal lampshades in Prairie and Contemporary designs. Visit [www.cliffsidestudio.com](http://www.cliffsidestudio.com) for his complete collection of patterns from Cliffside Studio.

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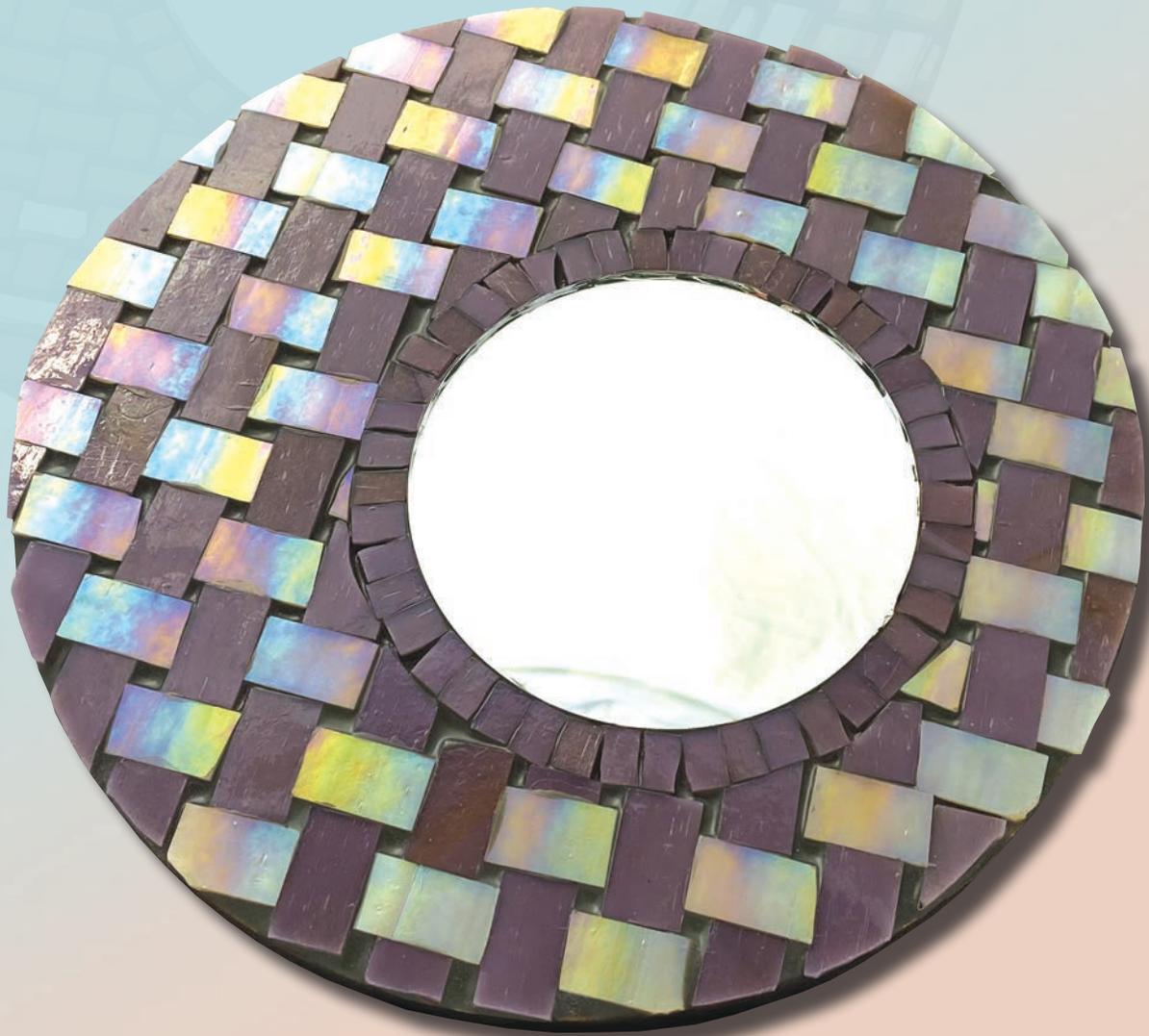
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# Quick and Easy Mosaic Mirror

*Design, Fabrication, and Text by Carrie Strope*



For this quick and easy mosaic mirror, we will be cutting tiles from stained glass and laying them in a basket weave pattern. The tiles are all the same size, and the colors you use can make the mosaic look even more like textiles if you select glass that has a grain in the pattern.

My adhesive of choice for mosaic projects is No Days Mosaic Adhesive or No Days Groutless Mosaic Adhesive, so much so that I bought it from the previous owners in January 2020. No Days Mosaic Adhesives are heat-set adhesives that are quick and easy to use with far less mess than traditional glue-as-you-go adhesives. For this pattern in particular, it's easy to unintentionally build rows that skew from parallel. If that happens, you can reheat a section of

the mosaic to fix the spots where your pattern deviates from the lines. You can choose to skip the grouting portion of the process and use No Days Groutless Mosaic Adhesive instead for an even quicker and less messy finish.

To begin, decide upon your color palette and how many colors you want to use. The basket weave design works great with two colors, but it can be used with a monotone one-color scheme or as many colors as you want to use. If you use one color, you should buy enough glass to fully cover the substrate. Having extra glass is always better than not having enough and trying to hunt down more of the glass that you need. If you choose two colors, buy enough to cover half of your substrate.

### Glass

Single Color of Stained Glass,  
1 Sq. Ft. or Two Colors, 1/2 Sq. Ft. each  
4" Round Mirrored Glass

### Tools and Materials

Morton System Cutting Board Safety Glasses  
Mosaic Nippers Tubs for Catching Glass Nips  
Sharpie® Marker Glass Cutter  
Running Pliers Breaking/Grozing Pliers  
Bench Brush and Dustpan  
Carborundum Grinding Stones Tweezers  
Heat Gun or Heat Embossing Tool Razors/Scissors  
Lens Cutter/Circle Cutter (optional)  
10" Round MDF Board Substrate  
No Days Groutless Mosaic Adhesive or  
Mosaic Adhesive and Sanded Grout Hanging Hardware  
Acrylic Paint for Edges and Back of Substrate (optional)

1



Cut the glass into 1" x 3/4" tiles.

I prefer using the Morton System, since it makes quick and easy work of cutting multiple tiles. I place a piece of masking tape along the bottom bar, then measure and mark where I want to cut my tiles. In this case, I marked both 1" and 3/4".

To cut strips, I square off the piece of glass if it isn't already. Then I score several 1" lines across the glass—scoring, moving, and scoring again. After I have an even number of score lines, I break the entire section off in one piece. If the other side of the glass is smooth enough to score on, I rotate it 90 degrees, flip it over, and begin scoring every 3/4". If the glass is only smooth on one side, I will cross the previous score lines.

After scoring in both directions, it's time to break the glass off in groups of four, breaking the short direction first. Continue breaking the glass in half in the shortest direction for the most reliable breaks.

2



Cut the mosaic adhesive to fit the substrate before adding the mirror.

Using an X-Acto or razor, cut the No Days Groutless Mosaic Adhesive to the size of the substrate and place the mirror in the middle or off center.

3



Nip small pieces of glass to use for the mirror border.

Cut two 1/4" to 3/8" strips from one of the colors of glass that you will use as a border around the mirror. Nip small rectangles or squares from the strips using your mosaic nippers and the tub to catch the little bits.

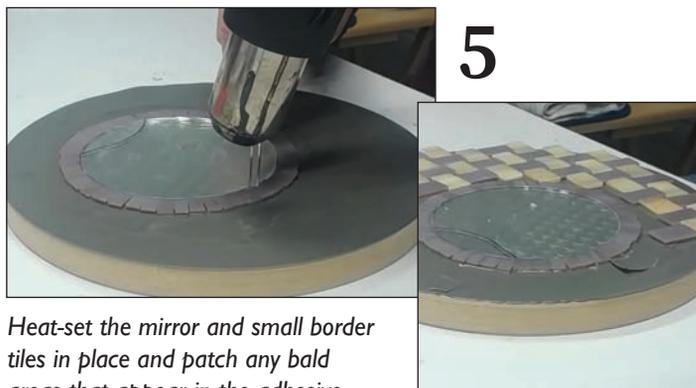
4



Use the nipped pieces to place a ring of small tiles circling the mirror.

It's okay to be close but not exact when laying down the tiles. We'll get persnickety when it's time to heat-set the adhesive.

5

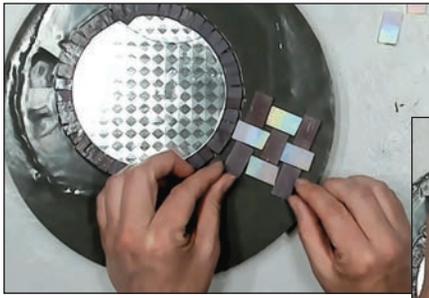


Heat-set the mirror and small border tiles in place and patch any bald areas that appear in the adhesive.

When using the heat gun, be sure to hold it 6" to 8" above the substrate and tiles so that everything gets heated slowly. Try to aim only at the tiles you have laid down and not areas where there are no tiles covering the adhesive, since the adhesive can pull back on itself during the heat-set for the mirror and border tiles leaving bald areas on the substrate. If that happens, you can cut more little pieces of adhesive to put down in the bald areas.

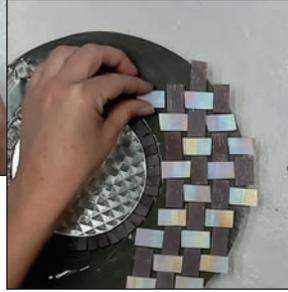
Use tweezers or another heat proof tool to move the tiles into place as you're heating. When the tiles get to 160°F, they will activate the adhesive underneath them. You will know that the tiles are hot enough, since you will be able to easily slide the tiles exactly into place when the adhesive has melted.

Remove the heat and make sure the tiles are where you want them by wiggling them and pushing down on them. When the tiles have cooled slightly, you can continue laying down the rest of the design.



6

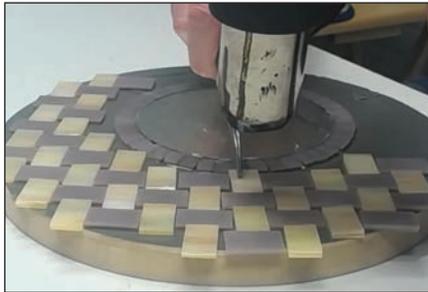
Lay down the tiles in the basket weave pattern, alternating colors according to your preference.



It can be easy for your rows of basket weave tiles to skew off course, so you may want to draw guidelines on the adhesive using a Sharpie and a ruler to ensure that your rows of tile pieces go on straight.

7

Heat-set the tiles in sections.



Wait to fill the spaces that are close to the edge and the mirror in the middle until you have placed the rest of the background. You can either heat-set all of the tiles at one time or place a small area of tiles and heat-set them as you go. The advantage to heating small areas as you are placing the tiles is that your pattern will remain tight. That way, the following pieces will go down where they need to be, so you don't have to move things around as much. The disadvantage is that you may unintentionally heat the adhesive in areas and cause it to pull back on itself.

8

Finish placing the tiles on the edge of the substrate and score the glass.

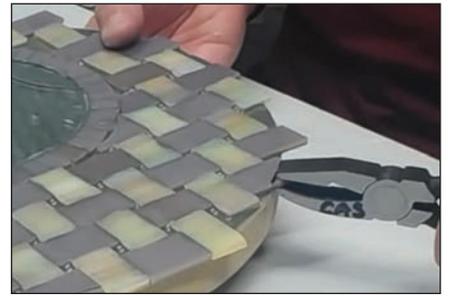


Fill in the areas on the edge of the substrate and any small gaps surrounding the bordered mirror. Use the Sharpie to mark on the tile where you want to cut the edge tiles to make them fit, then score the glass.

When placing tiles on the outside edge, you can mark and cut each one individually, or you can put whole tiles down and heat-set them, then cut the excess tile away after the pieces have cooled down and are secured in place.

9

Break the scores at the edge of the substrate and heat-set the remaining tiles in place.



If any tiles have moved out of place or need to be moved or removed, you can reheat them and reposition or remove them.

10

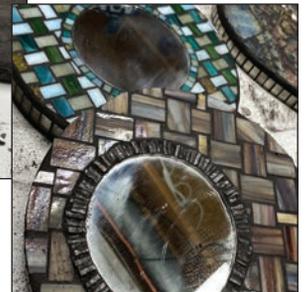
If any excess adhesive ended up on top of the tiles, scrape it away using a razor.



11



After letting the tiles cool down for 5 to 10 minutes, you can grout the mosaic.



If you want to grout the mosaic, you can do that now. However, if you used No Days Groutless Mosaic Adhesive, you can skip this step.

Paint the edges of the substrate to finish the mirror. Alternatively, you can glue mirror tiles on the edges to add even more sparkle when the sun hits the mirror. Additional variations include using tile sizes 1" and 5/8" to accentuate the trompe l'oeil basket weave pattern to make the tiles look like a dog bone. You can also use smaller 3/8" x 5/8" tiles for a more intricate pattern. Play with the width of some of the rows and tiles to add even more accents.

To finish, attach a hanger to the back side of the mosaic and proudly display your functional work of art!

**GPO**



Carrie Strobe, a teaching artist specializing in fused glass and mosaics, is the owner of No Days Adhesives. She works with students K through 12 as well as adults, creating individual and collaborative art pieces for installation in public and private institutions.



In addition to teaching locally in Lincoln, Nebraska, Carrie travels internationally to teach in glass studios and at national conferences including the Glass Craft & Bead Expo and the annual American Mosaic Summit. To view more of Carrie's work, visit [www.calyxglass.com](http://www.calyxglass.com) as well as her shop at [www.etsy.com/shop/CalyxAnn](http://www.etsy.com/shop/CalyxAnn).



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# A Loving Heart

*Design, Fabrication, and Text by Leslie Gibbs*

*Photography by Jon Gibbs*



“Ah, but art and trouble go hand in hand. If you cannot be troubled to create art from your heart, then your art will never trouble the heart of others.” – Lisa Mangum

This heart in hands design can have several interpretations . . . you hold my heart, caregiving, love, a cherished person, or a moment in time. I'll leave it up to you to decide. The important thing is that it shows affection. As glass crafters, it may suggest that your hands create something from your heart.

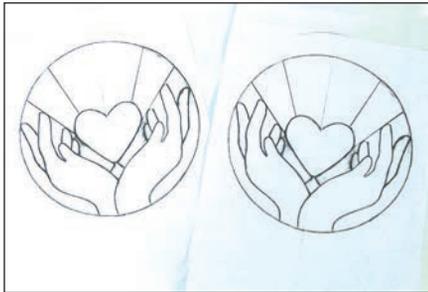
### Glass

Clear Rainbow Iridescent for Hands, 11" x 6"  
Cranberry Pink Iridescent for Heart, 3" x 3"  
Light Sky Blue Iridescent Rainbow  
for Left and Right Rays, 4" x 5"  
Light Aquamarine Blue for Center Rays, 4" x 5"  
Neo-Lavender Opalescent  
for Lower Background, 4" x 6"  
Dichroic or Iridescent Glass Scrap  
for Diamond Below Heart

### Tools and Materials

1", 1/4", and 1/8" Diamond Grinding Bits  
Glass Saw (optional) Steel Pushpins Horseshoe Nails  
3/16" and 1/8" Silver-Backed Copper Foil  
Black Patina Kem-O-Pro Polishing Wax  
Soft Cloths Cotton Swabs Flux  
Flux Remover Hanging Hooks  
Needle Nose Pliers Old Toothbrush  
U-Channel Lead or Zinc

1



Make two copies of the pattern.

Use one copy to cut apart for tracing the pattern pieces onto the glass and the other for laying out the glass pieces.

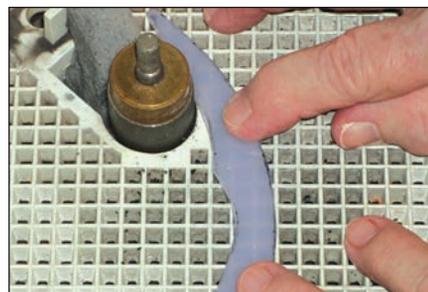
2



Cut out all the glass sections.

The hand section between the thumb and forefinger is easier to cut using a glass saw. If you don't have one, you can grind the section using the 1/8" and 1/4" bit on your grinder.

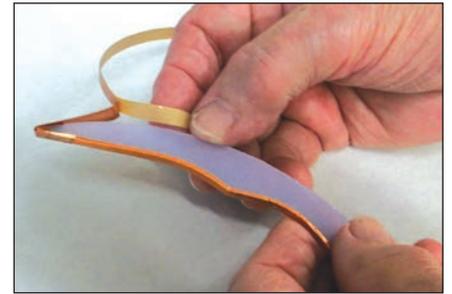
3



Grind and clean all of the sections of glass and set them aside for foiling.

Foil each section of the glass using silver-backed copper foil.

4



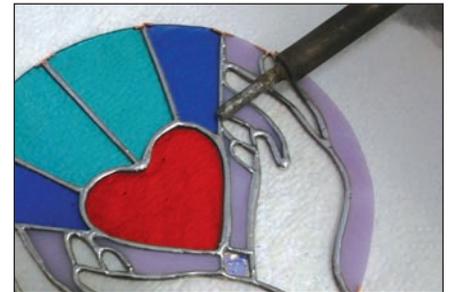
Lay out the glass pieces on the pattern.

5



Lay out all of the foiled glass sections on the pattern copy and secure the circular outline in place using steel pushpins to prevent the sections from slipping during soldering.

6



Apply the solder.

Flux the copper foil and solder the sections together; then flip the panel and solder the other side. Clean off the flux with flux remover.

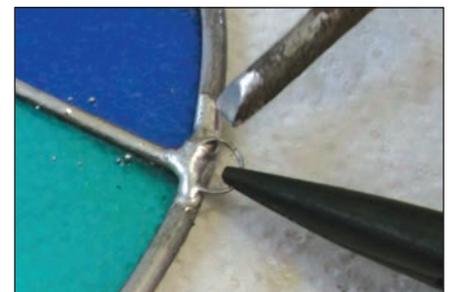
7



Frame the panel.

Using U-channel zinc or lead came, wrap the framing material around the panel and secure it in place with horseshoe nails. Solder the two ends of the came together as well as any place where the solder lines meet the framing metal. Do this on both sides of the glass, then clean off any excess flux.

8

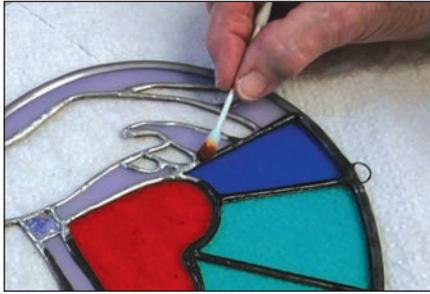


Add the hanging hooks.

Attach the hanging hooks by soldering each one to the solder lines of the rays near the framing, not on the framing itself. Once again, clean off any excess flux.

9

Apply the patina to the solder lines and frame.



I like using cotton swabs to apply patina on smaller projects, but you can also use a clean rag or brush instead. Apply the patina to both the solder lines and the framing on both sides of the panel. Rinse off the excess patina and let the panel dry completely.

10

Wax and polish the panel.



Using a clean, soft cloth, apply the polishing wax to the panel and let it dry to a soft haze, then apply the polish to the other side of the panel.

11

Buff both sides of the panel to finish.



When the wax has dried, use another clean soft cloth to gently buff both sides of the panel to a bright shine. I find that using an old toothbrush helps get into tight areas.

And there you are, two hands holding a heart—a symbol of so many occupations, situations, and just plain nurturing. As glass artists, the only situation we do not want represented is a broken heart. We all know what that means, and it usually involves language inappropriate to nurturing.

GPO



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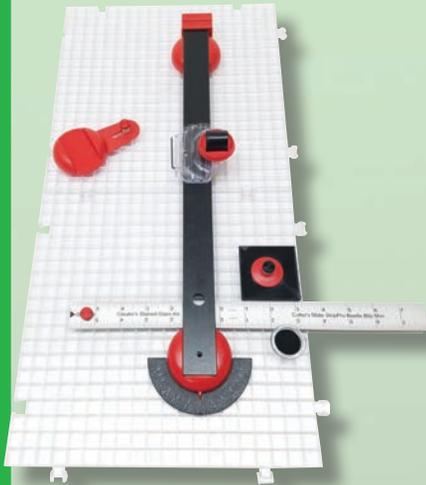
With a main focus in drawing and painting, Leslie Gibbs enjoys transforming her more traditional artwork into glass. Charmed by both wildlife and the creatures of the sea, she often depicts the real along with the fanciful denizens of these worlds in her design and pattern books.

Leslie and Jon are longtime Florida residents. They currently live and work in a small beach town in Northern Florida, having forsaken the Badlands of South Florida for a more peaceful lifestyle featuring more wildlife and less concrete. A relentless jokester, the artist tackles life's common absurdities with a wicked sense of humor and a relaxed attitude. Visit [www.facebook.com/lesliegibbsstudio](http://www.facebook.com/lesliegibbsstudio) to learn more about Leslie and her art.

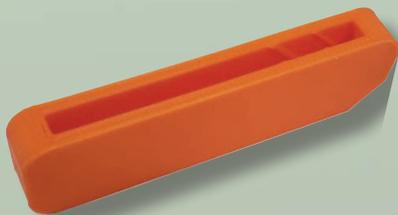
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# Yellow Rose Fan Lamp

Design by Kat Patrick, Fabrication and Text by Carrie Deutsch

Photography by Carrie Deutsch



I love to make fan lamps, because they have so many uses. In a nursery they can provide the perfect amount of light. Elsewhere in the house, they can bring a soft glow, just enough to see your way. Fan lamps can be elaborate or simple, and they make amazing gifts. The fan shape lends itself to unlimited creativity.

My favorite kind of fan lamps to make usually feature roses. This is not only because roses typically symbolize love, but the color of the rose can also be associated with different spiritual concepts.

For this 10" x 8.5" project, I chose yellow roses because they remind me of sunshine. They burst with happiness and symbolize optimism, energy, and joy.

The petals of a rose make me think of the mystery in the layers. Like us, we are beautiful on the outside, but the real beauty lies within. Uncovering the layers that make us unique, like peeling away the layers of petals, brings into view the soul inside that only those who are closest to us can see.

### Youghiogheny Opalescent Glass

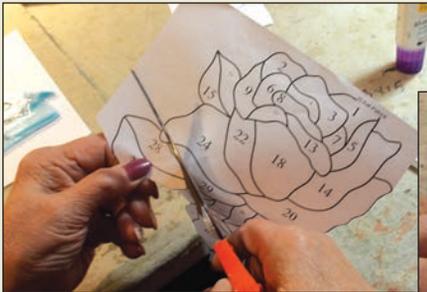
Amber/Green/Brown Landscape Stipple for Leaves, Scrap  
4444 SP Green/White Stipple for Leaf Stems, Scrap  
1025 SP White Ice/Amber/Silver Yellow Stipple  
for Roses, 1/4 Sq. Ft.

### Wissmach Glass Co.

257-L Medium Purple/Sky Blue/Light Amber/  
Light Opal/Crystal for Background, Scrap

### Tools and Materials

Foil Pattern Sheers    Glue  
Toyo Pistol Grip Cutter    Grozing Pliers  
Running Pliers    Grinder    Pushpins  
Paper Towel    X-Acto® Knife  
7/32" Black-Backed Copper Foil  
3/16" Black-Backed Copper Foil  
Foil Burnisher or Fid    Classic 100 Gel Flux  
60/40 Solder    Hakko FX-601 soldering iron  
Kwik-Clean® Flux Remover    Nitrile Gloves  
Novacan Black Patina    Wooden Jig  
Metal Fan Base    Night Light Bulb  
Plastic Scrubby    Mothers® Carnuba Wax  
Clarity Polish    Soft Rags  
Fingernail Brush    Water-Filled Spray Bottle



1

Cut out the pattern pieces and adhere them to the glass.



Begin by making two copies of the pattern, one for cutting out the glass pieces and the other for assembling the cut glass pieces on the pattern. All glass artists have their own way of cutting the pattern apart. I use pattern shears when cutting the pattern apart to avoid having the pattern grow after the glass pieces have been foiled.

2

Score the glass as close to the pattern paper outline as possible.



3

Use breaking or grozing pliers to break off any excess glass.



4

Grind the cut glass pieces and assemble them on the second copy of the pattern.



If you have done a good job when cutting, there really won't be a lot of grinding needed to make the pieces fit together well.



5

Make sure that all of the glass is clean, then apply foil to the edges of the glass pieces.



I use a variety of sizes from 7/32" and 3/16" to 5/32" depending on the thickness of the glass. The object is to have nice, narrow foil lines. For deep curves, I have found that if I warm the foil up by running my fingers over it a few times, it will generally smooth out nicely. If the foil splits, use some foil over the split and trim off the excess.

6

Use the flux brush to apply the gel flux to the foil lines.



As you apply the flux, it is important to do a good once-over before you start soldering to make sure there are no areas on the foil called tags that do not meet perfectly. If you see any, this would be the time to use an X-Acto knife and trim them off.



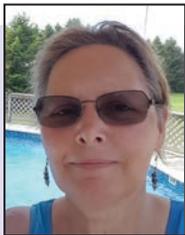
Tack-solder the panel at the joints before running a nice, rounded bead of solder over all of the foil lines.



Once you are done soldering the first side, clean off all of the flux residue using Kwik-Clean Flux Remover, then flip the piece over and solder the back side of the panel. I have a handy wooden jig that I use to hold the fan lamps while I run a bead on the top edge of the fan. You can do this using anything that will help hold the glass fan while you solder.

Once you have cleaned the panel to remove any flux residue, apply the patina.

8



Kat Patrick has been creating glass art for over 30 years and started out working with Heart Stained Glass. The patterns Kat creates are so realistic and full of life. She has the ability to take the most rudimentary drawings and create magical works of art. You can find more about Kat and how to purchase her stained glass patterns on Facebook at Katz Creations in Stained Glass.

Put a little of the black patina in a plastic cup and use a cotton ball to apply it to the solder lines. Once you've covered all of the lines, wipe off any excess patina with a paper towel. Use a bottle of water to spray down the panel and pat dry. Repeat on the reverse side.

9

Apply wax to the panel and buff well.



Once the panel is dry, use a soft rag such as a cut-up T-shirt to apply the wax to the panel. I do not wait for the wax to dry before I use another soft rag to buff up the wax. Continue to buff the panel until you do not see any more black coming off on the rag. To remove any dried wax in tiny crevices, you can use a fingernail brush.

Place the glass fan into the slot of the fan base. You can purchase wooden or metal fan bases at most of your glass supply stores. For this fan, I decided it looked best in the metal base. **GPO**

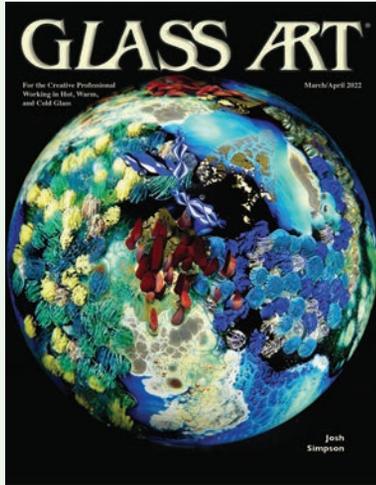
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Carrie Deutsch has always had a passion for color and has been a crafter all her life. After her father's death, she looked for something she could immerse herself in to take her mind off of her loss. During that search, she stumbled into a stained glass shop in Cary, North Carolina, and fell into the proverbial rabbit hole of stained glass.



Carrie has been creating stained glass items for close to 30 years. In addition to her stained glass work, Carrie enjoys cooking/baking, scrapbooking, reading, and spending time with her family. She also devotes a lot of her time to her community, running fundraising efforts for their local Fire Department. You can see more of Carrie's work at [www.facebook.com/Carriebearcreations](http://www.facebook.com/Carriebearcreations).





The March/April 2022 issue of *Glass Art*® is filled with profiles of exceptional glass artists plus tips for improving your own glass art creations. Over the past 50 years, glass art pioneer Josh Simpson has created extraordinary blown glass art, including his latest *Planets* series.

Our continuing column, *Artist to Artist*, offers thoughts from Bruce Sillars, Charles Gabriel, Erwin Timmers, and Jeremy Bert on whether or not artists should share their personally developed techniques with other artists.

International Glass Artists Robert Emeringer and Zaiga Baiza share their techniques for repairing antique stained glass windows, and Coatings By Sandberg announced the company's latest Dichroic By Design contest winners.

Milon Townsend describes the benefits of exploring new techniques and equipment, and Bob Leatherbarrow offers a summary of the tools and techniques he has shared with *Glass Art*® readers over the years to make his recent *PanPal* artwork.

Rounding out this issue is news from the International Society of Beadmakers on its upcoming 30th anniversary celebration, the Contemporary Glass Society's exhibition in partnership with the Makers Guild in Wales, and the American Glass Guild's 2022 Summer Conference at The Corning Museum of Glass.

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# Twenties Remembered

Design by Suzanne Cooper, Text by Darlene Welch

The look of the 1920s glamour days is captured perfectly in this 10-1/4" x 31" Art Deco-style panel, *Twenties Remembered*, part of the *La Galleria* pattern collection by the late glass artist Suzanne Cooper. The dress, with its long, flowing peacock train and shimmering gold accents, adds color and beauty to the design and stands out against the shimmering background to provide a feeling of depth to the panel.

In addition to the six window patterns in the *La Galleria* collection, that are also six matching lampshade patterns and twelve bonus projects. These striking patterns feature a wide array of subjects including classic designs, flowers, and more.

Suzanne's daughters recently shared a picture of her remarkable artistic virtues. "Our mom had what she called the "curse of creativity." Her love of color, texture, and all things shiny took her all over the world in search of her next project. She loved to teach to those who shared her passion and found beautiful inspiration in her worldwide travels. Mom started creating with fabric and yarn, where she then moved to oil painting. Then she discovered designing with stained glass and finally glass beads. She was a tremendously talented designer, and she is missed every single day!" For more of Suzanne's designs, be sure to visit [www.sova-enterprises.com/catalog/index.php?manufacturers\\_id=32](http://www.sova-enterprises.com/catalog/index.php?manufacturers_id=32).

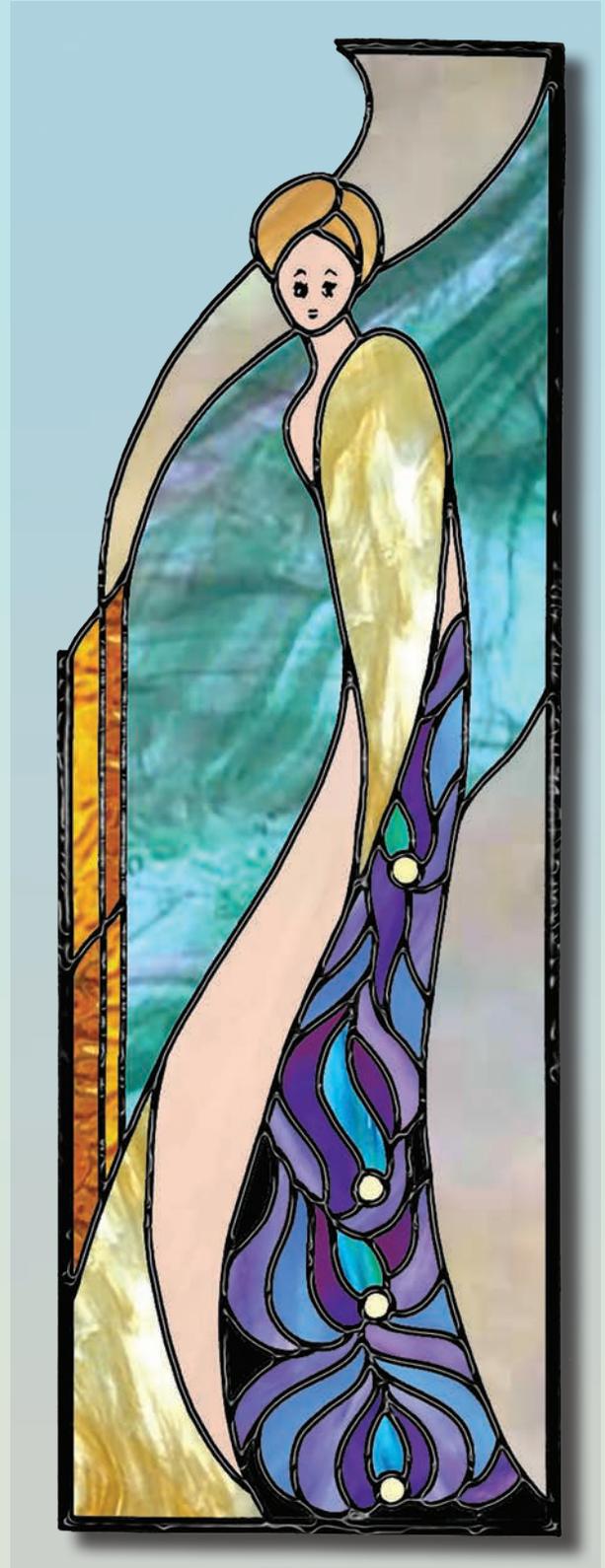
GPO

## Wissmach Glass Co.

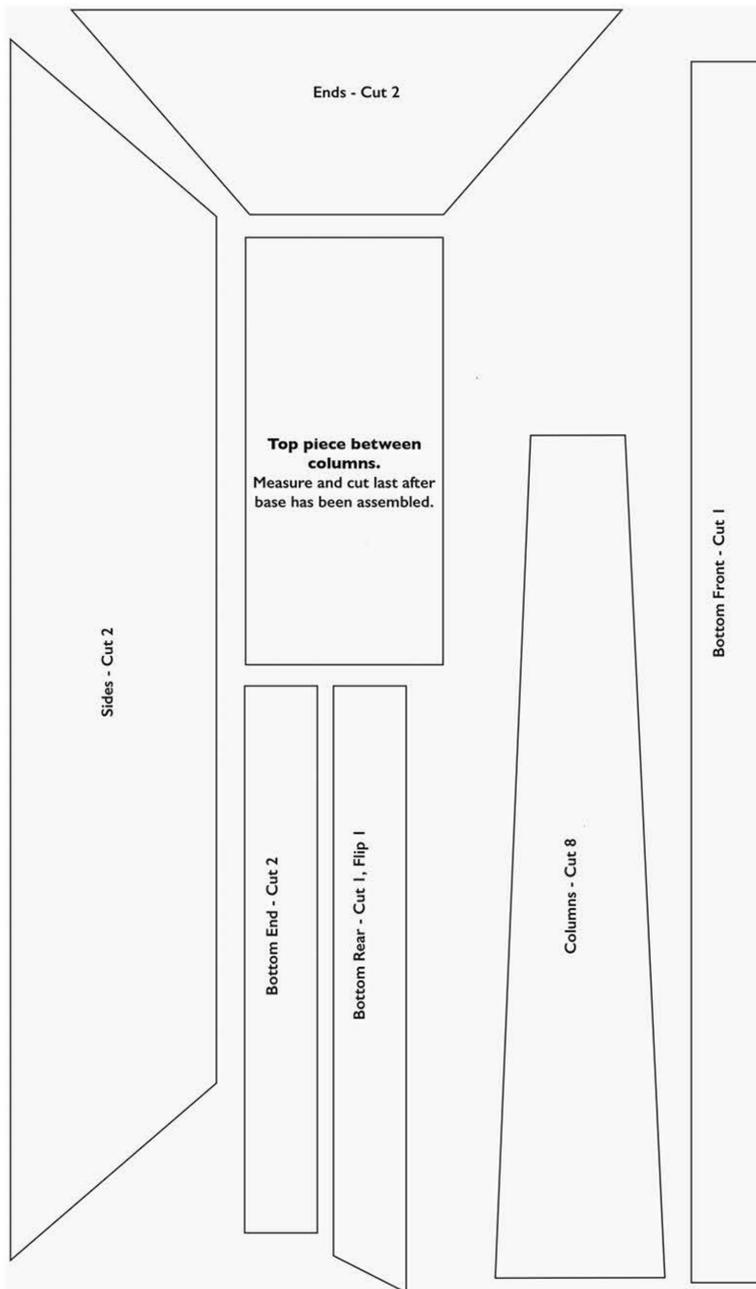
- 145-SP Dark Amber/Opal/Crystal for Hair, Scrap
- 567-D Dense Opal/Champagne for Face and Neck, , 1 Sq. Ft
- WO-58 Medium Amber/Opal/Crystal Wispy for Dress, 1 Sq. Ft
- 197-N Dark Blue/Yellow Green/Light Opal  
for Peacock Train, Scrap
- 97-LL Dark Cobalt Blue/Dark Purple Streaky  
for Peacock Train, Scrap
- 238-L Dark Purple/Dark Blue/Light Opal/Crystal  
for Peacock Train, Scrap
- 118-D Cobalt Blue/Dense Opal/Crystal for Peacock Train, Scrap
- BLACK DR Dense Black Double Rolled for Peacock Train, Scrap
- 000 Pale Light Amber for Peacock Train, Scrap
- 49 RIP Dark Amber Ripple for Window, Scrap
- 310H Medium Amber Hammered for Window, Scrap
- WO-251 Aqua Green/Purple/Opal/Crystal Wispy for Back-  
ground, 2-1/2 Sq. Ft
- 565-L-IR Gray Light Opal/Dark Gray Iridescent for Background,  
2 Sq. Ft

## Tools and Materials

- 7/32" Copper Foil Flux Solder
- Black Patina 1/4" U-Channel Zinc



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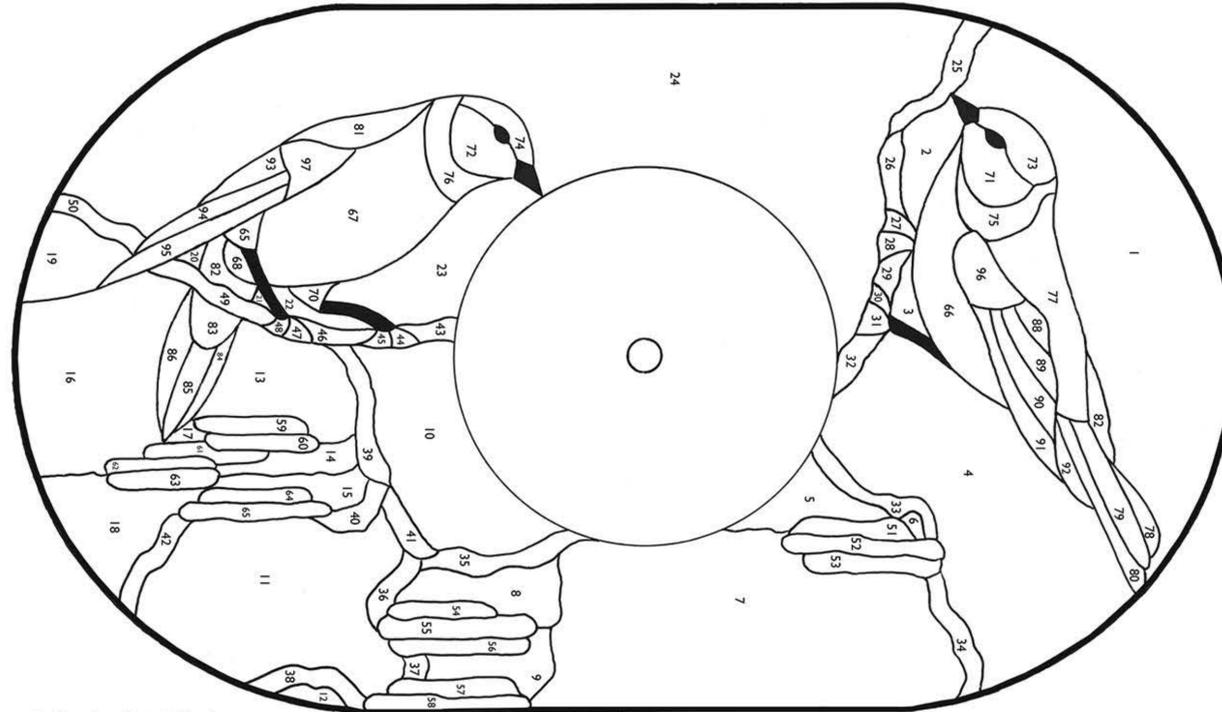
## Cliffside Double Column Glass Lamp Base

Design by Alex Spatz  
Wissmach Glass Co.  
9976-581 Amber/White Iridized, 15" x 20"

## Birds Wall Clock

Design by Evamarie Volkmann  
Glass Color Placement indicated  
with Pattern Numbers  
Light Blue/Yellow Mottled for 1-24, 1 Sq. Ft.  
Remaining Glass Colors Cut from Scrap  
Dark Brown for 25-50 25-50  
Dark Yellow for 51-65  
Light Yellow for 66-70  
White for 71-72  
Turquoise for 73-74  
Dark Blue for 75-76  
Green Blue for 77-86  
Honey/Blue for 87-95  
Dark Honey for 96-97  
Black or Solder for Eyes, Beaks, and Legs

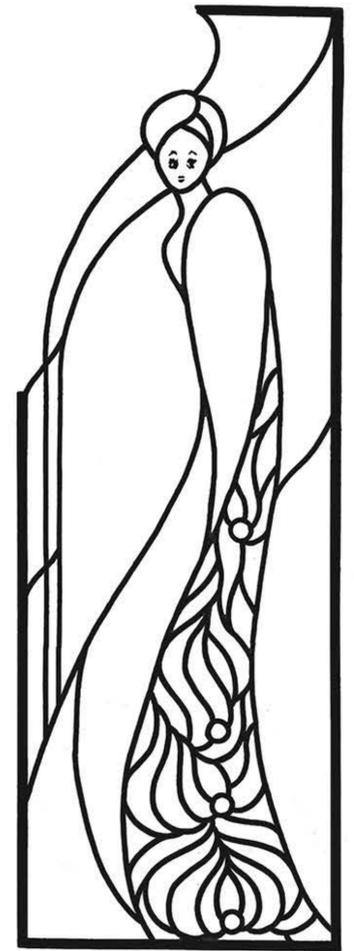
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Double column Stained Glass base  
Legal size paper

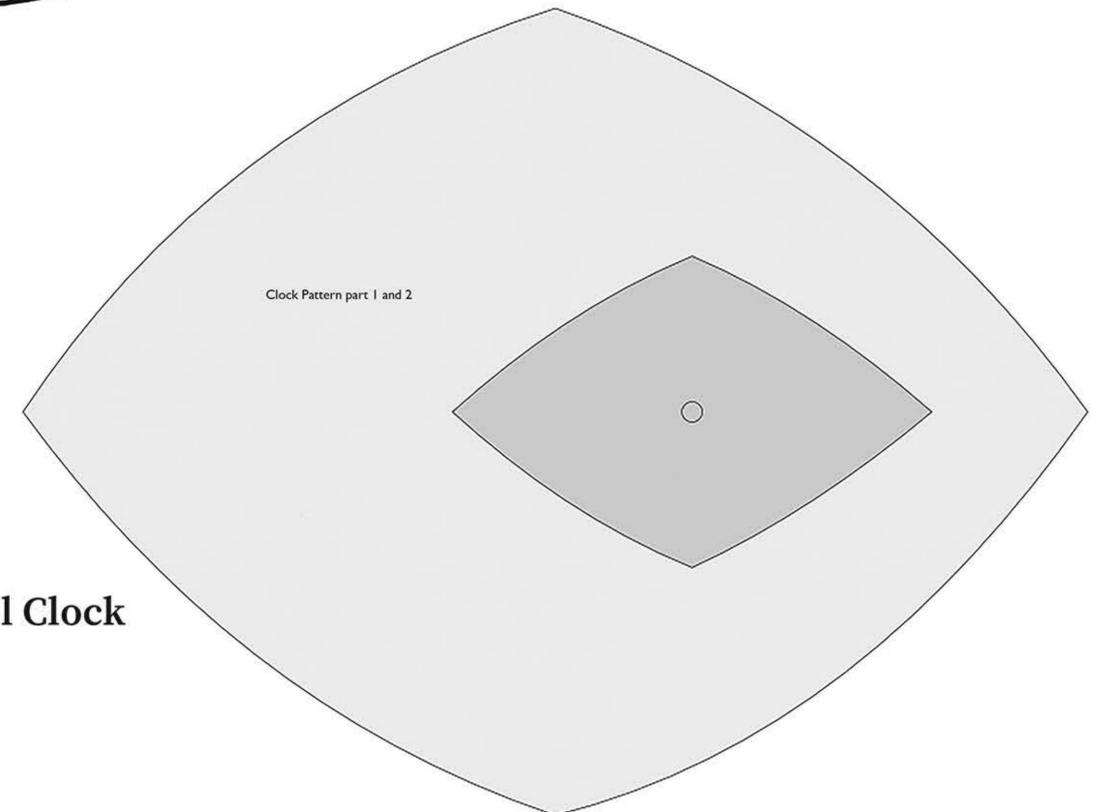
**DIRECTIONS**  
Cut and Foil all parts except center. Assemble parts, measure and cut center piece last. Finish with 1/4" brass or zinc "U" channel on the bottom. Connect Columns with 2 sections of rebar (see directions) soldered to corners of columns. Solder brass crossbar in the center.

**Wissmach Glass Co.**  
145-SP Dark Amber/Opal/Crystal for Hair, Scrap  
567-D Dense Opal/Champagne for Face and Neck, 1 Sq. Ft.  
WO-58 Medium Amber/Opal/Crystal/Wisspy for Dress, 1 Sq. Ft.  
197-N Dark Blue/Yellow Green/Light Opal for Peacock Train, Scrap  
97-L Dark Cobalt Blue/Dark Purple Streaky for Peacock Train, Scrap  
238-L Dark Purple/Dark Blue/Light Opal/Crystal for Peacock Train, Scrap  
118-D Cobalt Blue/Dense Opal/Crystal for Peacock Train, Scrap  
BLACK DR Dense Black Double Rolled for Peacock Train, Scrap  
000 Pale Light Amber for Peacock Train, Scrap  
49 RIP Dark Amber Ripple for Window, Scrap  
310H Medium Amber Hammered for Window, Scrap  
WO-251 Aqua Green/Purple/Opal/Crystal/Wisspy for Background, 2-1/2 Sq. Ft.  
565-L-IR Gray Light Opal/Dark Gray Iridescent for Background, 2 Sq. Ft.



## Twenties Remembered

Design by Suzanne Cooper



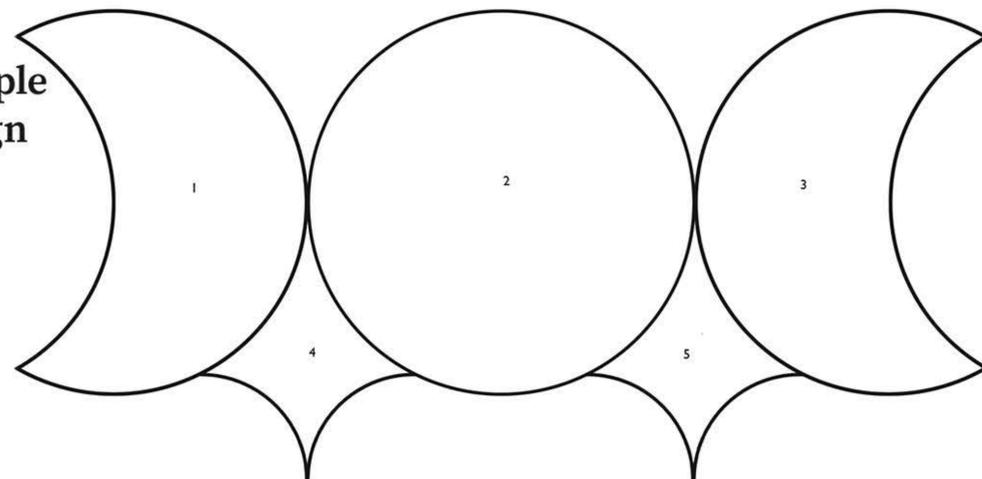
## Functional Art Wall Clock

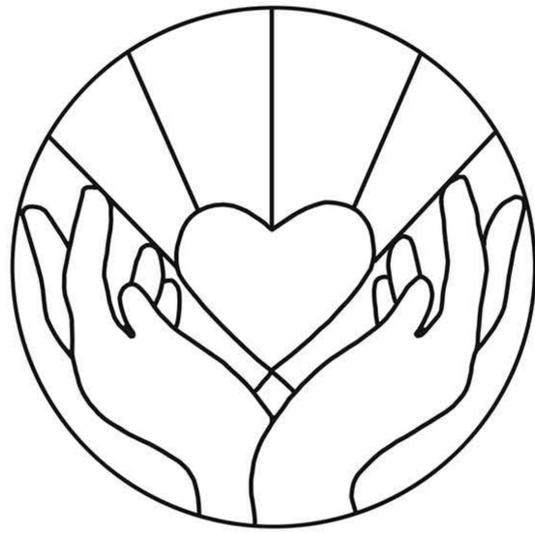
Design by Petra Kaiser  
Wissmach Glass Co.  
90-04-LU Luminescent Blue for Clock Background, 8-1/2" x 11"  
96-57 Prisma Crystal and White for Clock Face, 5" x 5"

## Pressed Flower Triple Moon-Phase Design An Introduction to Stained Glass

Design by Samantha Ashley

Wissmach Glass Co.  
01DEW Clear Dew Drop, 4-1/2" x 2-3/4"  
Additional Glass  
Cranberry Pink/White Double Rolled for Half Moons, 6" x 4"  
Petal Pink/Opal Double Rolled for Full Moon, 4" x 4"  
3/4" Clear Nuggets (2)  
4" Clear Round Bevel  
Single Strength Clear Glass, 6" x 4"



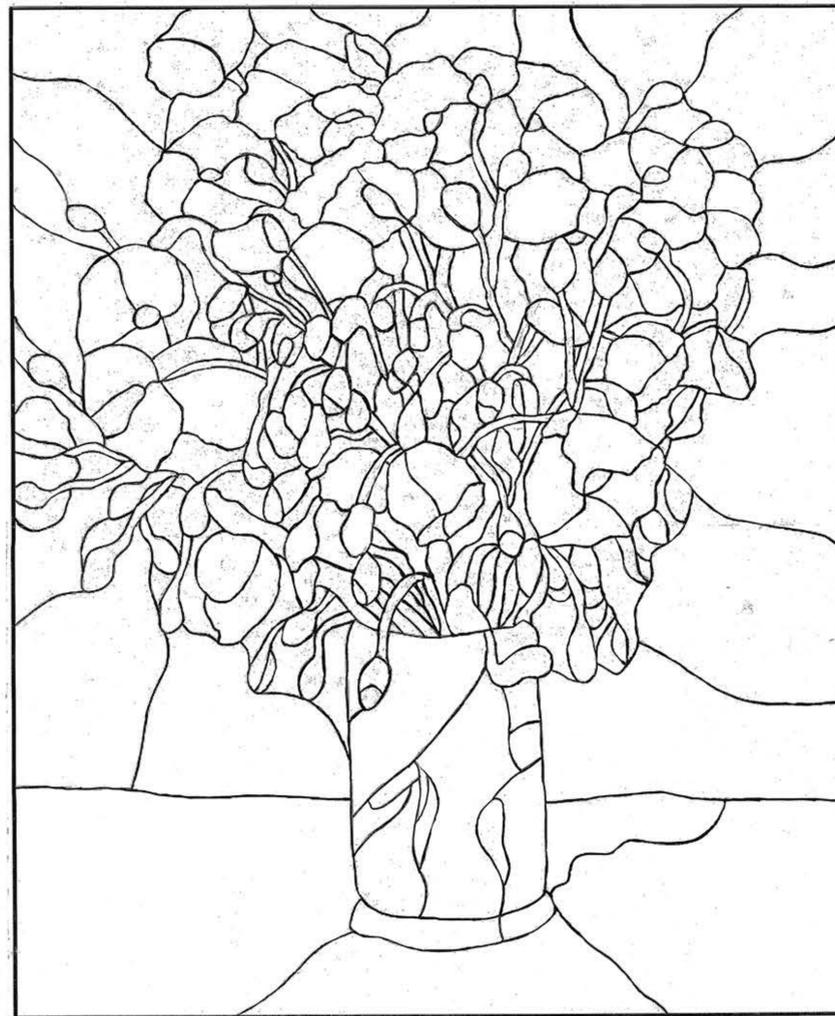


## A Loving Heart

Design by Leslie Gibbs

### Glass

Clear Rainbow Iridescent for Hands, 11" x 6"  
 Cranberry Pink Iridescent for Heart, 3" x 3"  
 Light Sky Blue Iridescent Rainbow for Left and Right Rays, 4" x 5"  
 Light Aquamarine Blue for Center Rays, 4" x 5"  
 Neo-Lavender Opalescent for Lower Background, 4" x 6"  
 Dichroic or Iridescent Glass Scrap for Diamond Below Heart



## Van Gogh's Poppies in a Vase

Design by Jenny Westphal

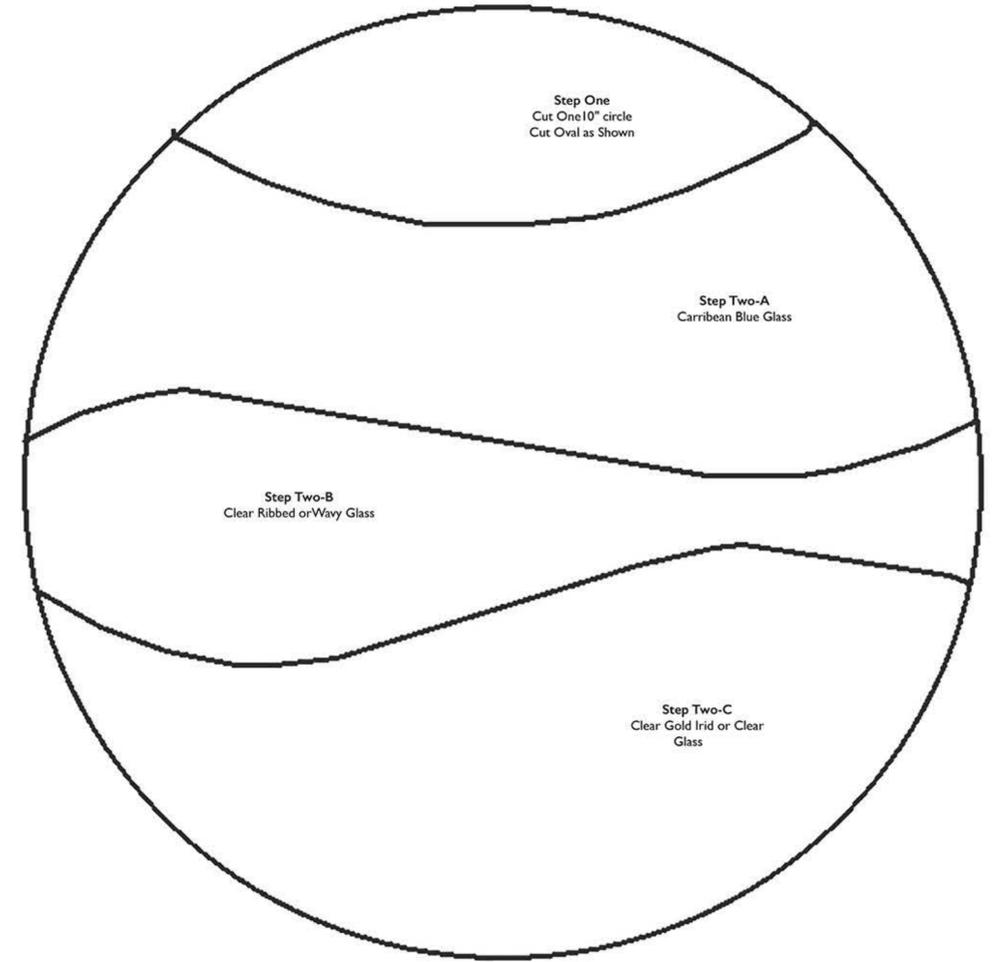
**Wissmach Glass Co.**  
 199LL Medium Amber/Dark Amber Brown Streaky for Table, 1-1/4 Sq. Ft.  
 310H, Medium Amber Hammered for Background, 3/4 Sq. Ft.  
**Additional Glass**  
 Off-White Solid Opal for Vase, 2/3 Sq. Ft.  
 Slate Dense Opal for Vase, 1/4 Sq. Ft.  
 Blue/Brown Streaky Ripple for Background, 3/4 Sq. Ft.  
 Red/White for Poppies, 2-1/4 Sq. Ft.  
 Amazon Green Opalescent for Poppy Stems, 1-1/4 Sq. Ft.  
 Sky Blue Rough Rolled for Background, 1-1/4 Sq. Ft.  
 Lime Green/White for Poppy Stem, 1/2 Sq. Ft.  
 Pink Iridized for Poppies, Scrap  
 Black Radium Iridized for Poppy Centers, Scrap  
 Gray for Background, Scrap  
 Brown Hammer-Backed for Poppies, Scrap

## Fantasy Fishbowl

Design, Fabrication, and Text by Mary Sherwood

### Glass

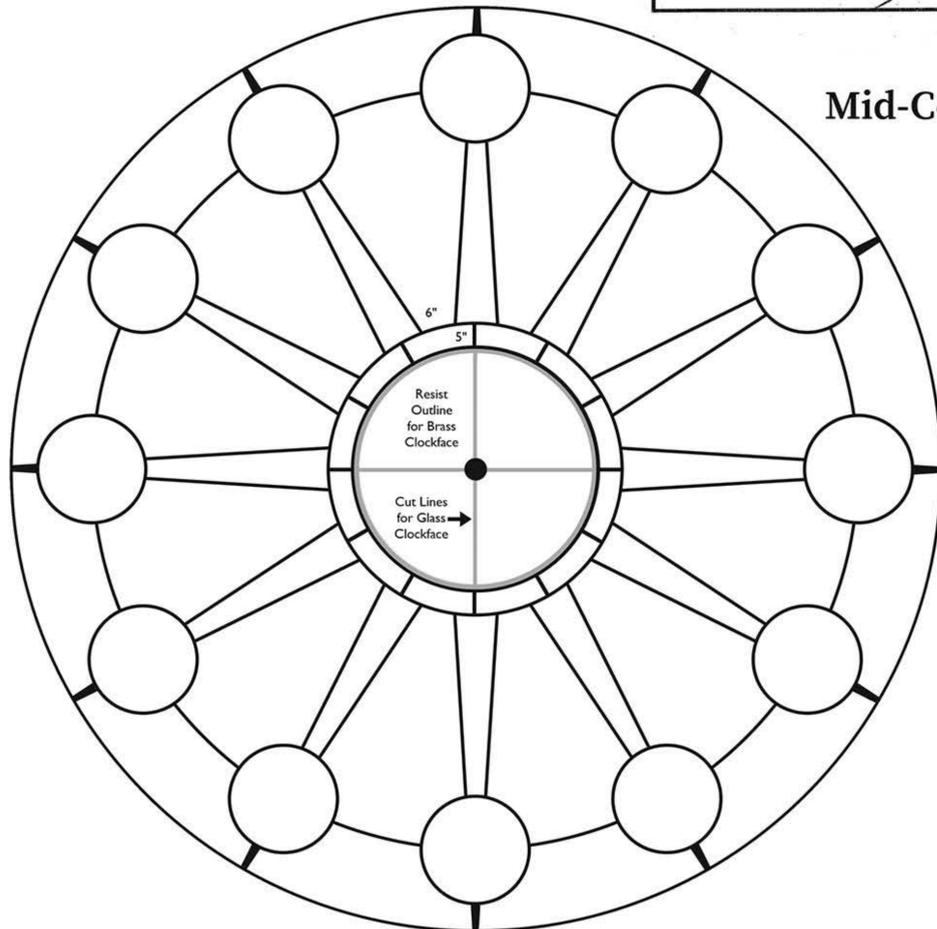
Clear Glass for Base, 10" Diameter Circle  
 Icicle Clear Transparent Iridized for Fishbowl Top, 5" x 12"  
 Clear Reeded Glass for Fishbowl Center, 4" x 12"  
 Caribbean Blue Solid Transparent for Fishbowl Bottom, 6" x 12"  
 Dark Blue Medium Frit  
 Sky Blue Medium Frit  
 Peacock Green Medium Frit  
 Assorted Pale Blue, Turquoise, and Clear Vitrigraph or Stringers  
 Assorted Clear, Ivory, Dark Blue, and Peacock Green Beads  
 Glass Scrap in Desired Colors for Fish



## Mid-Century Modern Wall Clock

Design by Chantal Paré

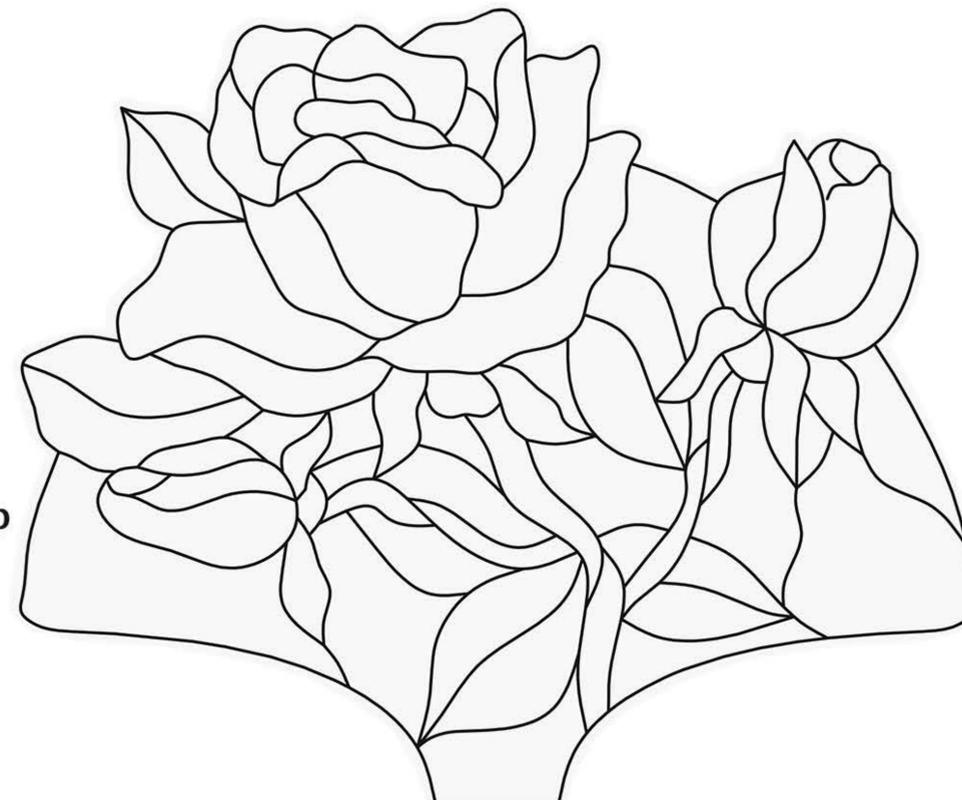
**Youghioghney Glass Co.**  
 4302 HS Avocado Green Opal/White/Chocolate Brown High Strike for Radiating Arms, 1 Sq. Ft.  
**Additional Glass**  
 Almond White for Clock Dial Border, 1 Sq. Ft.  
 3 mm Clear Float Glass for Background, 3 Sq. Ft.  
 3 mm Mirror for Outer Border, 2 Sq. Ft.  
 Orange, Mustard, Teal, Blood Red, and Olive Green for Hour Markers, Scrap



## Yellow Rose Fan Lamp

Design by Kat Patrick

**Youghioghney Opalescent Glass**  
 Amber/Green/Brown Landscape Stipple for Leaves, Scrap  
 4444 SP Green/White Stipple for Leaf Stems, Scrap  
 1025 SP White Ice/Amber/Silver Yellow Stipple for Roses, 1/4 Sq. Ft.  
**Wissmach Glass Co.**  
 257-L Medium Purple/Sky Blue/Light Amber/Light Opal/Crystal for Background, Scrap



## Fantasy Fishbowl

Design by Mary Sherwood

### Oceanside Glass & Tile

100S-ICE-F Clear Glass for Base, 10" circle  
 100QRS-F Clear Reeded for Base, X Sq. Ft.  
 532-IS-F Caribbean Blue Solid Transparent for Base, X Sq. Ft.  
 MF-223-725-F Turquoise Green Solid for Bottom of Fishbowl, X Sq. Ft.  
 ?????? Clear Gold Irid for Base, X Sq. Ft.  
 F3-136-F-8 Dark Blue Medium Frit for Sand  
 F3-5331-F8 Sky Blue Medium Frit for Sand  
 ?????? Peacock Green Medium Frit for Sand  
**Additional Glass**  
 Assorted Pale Blue, Turquoise, and Clear Vitrigraph or Stringers  
 Assorted Frits and Glass Nuggets  
 Assorted Beads  
 Glass Scrap for Fish

# Birds Wall Clock

Design by Evamarie Volkmann, Text by Darlene Welch

Bird lovers everywhere know that when springtime returns, their delightful feathered friends won't be far behind. This stunning 97-piece 7-1/2" x 12-3/4" Motif 12 design is one of 12 patterns from the 1989 *GlasDesign Wanduhren Wall Clocks* pattern packet by artist/publisher Evamarie Volkmann. Included in this collection of unique patterns are designs featuring florals, birds, cats, frogs, and more that will provide loads of ideas for creating the perfect accent for a friend's or your own home decor. For more GlasDesign patterns, visit [www.etsy.com/shop/GlasDesignPatterns](http://www.etsy.com/shop/GlasDesignPatterns).

## Glass

See Pattern Sheet for Glass  
Color Placement and Amounts.

Light Blue/Yellow Mottled for Background

Dark Brown for Branches

Dark Yellow for Seed Pods

Light Yellow for Breasts and Leg Tops

White for Cheeks

Turquoise for Head Tops

Dark Blue for Neck Rings

Green Blue for Wings and Tails

Honey/Blue for Wings and Tails

Dark Honey for Wings

Black or Solder for Eyes, Beaks, and Legs

## Tools and Materials

Quartz Clock Movement

4" Clock Face

40 mm and 30 mm Clock Hands



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# Van Gogh's Poppies in a Vase

*Design by Jenny Westphal, Fabrication and Text by Cindy Dow Savary*

*Photographs by Cindy Dow Savary and Gerry L. Savary*



In the summer of 2021, my daughter and I went to *Beyond Van Gogh, The Immersive Experience*. This exhibit has been touring the United States in most of the major cities. It is a totally different way of viewing art that perhaps brought us a little closer into Vincent's world. It was about the art, but also about the story of Vincent van Gogh where his paintings were shown on the walls and the floors, ever moving and then fading out like paint dripping from a brush. As you entered his world of color and imagination, you couldn't help but be in awe.

The creator of this event cleverly projected the images of 300 of the artist's paintings and swirled them into a magical world of cafes, landscapes, and flowers. The images of his paintings were vividly displayed in a way that almost made for a sensory overload. For those moments, there were a few benches where you could sit and take it all in.

Like many artists of his time, Van Gogh painted flowers. Although sunflowers were among his more favorite subjects, I was drawn to his *Poppies in a Vase* to feature in this 23-1/2" x 28-1/2" glass adaptation, perhaps because it reminded me of my mom's oil painting, *Zinnias in a Vase*. His interest in painting flowers was, in part, to further his appreciation and understanding of complementary colors.

Because of Japanese influence, Van Gogh began to paint in a brighter style. To save money on paints, he used wool in different colors to test combinations. In a letter to his sister, he wrote, "There are colors that make each other shine, that make a couple complete each other like man and wife." The complementary colors that he liked the best were yellow and purple, blue and orange, and red and green. Unfortunately, some of the paints he used were not stable, and over the years his paintings in which he used those colors have changed. His purple colors turned blue, orange changed into yellow or a less bright orange, and red changed into less bright red or even green and brown.

### Wissmach Glass Co.

199LL Medium Amber/Dark Amber Brown Streaky for Table, 1-1/4 Sq. Ft.

310H, Medium Amber Hammered for Background, 3/4 Sq. Ft.

#### Additional Glass

White Solid Opal for Vase, 2/3 Sq. Ft.

Slate Dense Opal for Vase, 1/4 Sq. Ft.

Blue/Brown Streaky Ripple for Background, 3/4 Sq. Ft.

Red/White for Poppies, 2-1/4 Sq. Ft.

Amazon Green Opalescent for Poppy Stems, 1-1/4 Sq. Ft.

Sky Blue Rough Rolled for Background, 1-1/4 Sq. Ft.

Lime Green/White for Poppy Stem, 1/2 Sq. Ft.

Pink Iridized for Poppies, Scrap

Black Radium Iridized for Poppy Centers, Scrap

Gray for Background, Scrap

Brown Hammer-Backed for Poppies, Scrap

### Tools and Materials

Foil Pattern Scissors Toyo Pistol Grip Cutter  
 Grozing Pliers Running Pliers Grinder  
 Permanent Markers Morton Layout Block System  
 Pushpins Rubbing Alcohol  
 Paper Towels X-Acto® Knife  
 7/32" Black-Backed Copper Foil  
 Aanraku® Foil Burnishing Roller  
 Lathekin/Plastic Fid Nokorode® Paste Flux  
 60/40 Solder Hakko FX-601 Soldering Iron  
 Safety Glasses Kwik-Clean® Flux Remover  
 Nitrile Gloves JAX® Pewter Black  
 Novacan Black Patina Liva Stained Glass Polish  
 Cotton Rounds Cotton Swabs  
 Horseshoe Nails Hammer Handy Hangers®  
 Cascade Metals 1/2" U-Channel Zinc Came  
 2" Cut-Off Saw Scotch-Brite Pad 1" x 6' Oak Frame  
 Aanraku® Stained Glass Bent Hook Hangers  
 Aanraku® Stained Glass Framing Screws

1

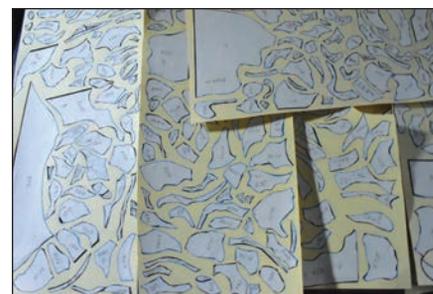
Color and number the pattern, then mark it for grain direction.



For more complicated patterns, I like to use letters to represent the color and/or part of the pattern piece plus a number. Coloring the pattern helps to pick out glass colors, and it is also great for separating by glass color.

2

Cut out the pattern pieces using foil scissors and glue them to tagboard.



You will then need to recut the pattern pieces using regular scissors. It is a little extra work, but you will get extra support when grinding.

3

Glue the pattern pieces to the glass.

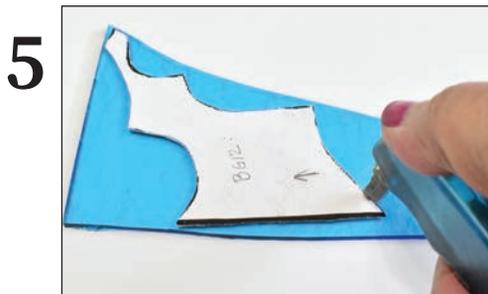


I let the glue dry overnight before I start cutting the glass. Sometimes I use a Sharpie to mark how I am going to cut the glass into the individual pattern pieces. On ripple glass, I leave more space between the pieces, because you do not always know how the glass is going to break.

Separate the glass into individual pattern pieces to make it easier to cut and break away the unwanted glass.



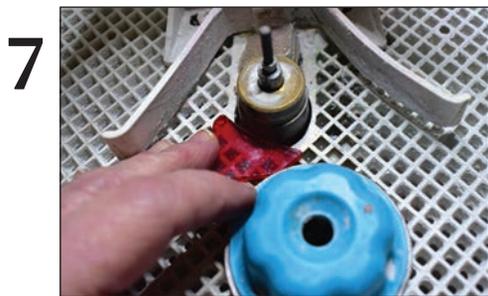
Score as close to the pattern pieces as possible.



Use grozing and running pliers as needed to separate and remove any excess glass.



Use a grinder to smooth out any rough edges.



Place the pieces of glass on the layout copy.



I use the Morton Layout system to keep the pieces in place.

Clean each piece of glass with rubbing alcohol and dry, then apply the foil to all of the glass pieces.

9



I like to foil by hand. Put the glass to the foil, making sure it is centered, then wrap the entire piece. Try not to overlap the foil. Use your finger to smooth the foil on each side and burnish the foil with either a fid or foil roller until it is smooth on both sides of the glass and on the edge.

Flux the copper foil lines before soldering the panel.

10



Apply flux to the copper foil lines and tack-solder each joint before running a smooth, raised bead of solder on the front and back. To get a nicer raised bead of solder, "Do the Dip." This is a new method I learned from Guy Somers, owner of Mongo's Art Glassville. You dip the solder into the Nokorode paste flux then solder away. The solder goes on like melted butter.

Thoroughly clean the project using Kwik-Clean to remove any residual flux.

11



Apply the Novocan black patina.

12



Be sure to wear gloves. After the patina has been applied, clean the piece again with Kwik-Clean.

13

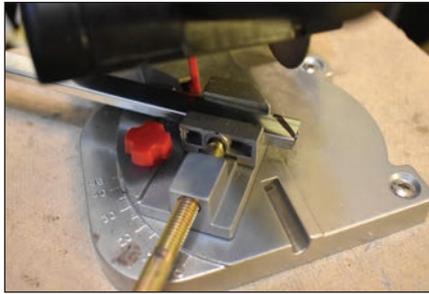
Polish the panel.



Add a thin layer of Liva Stained Glass Polish and let it dry. Wipe off the polish using cotton rounds. For those hard-to-get places, use cotton swabs.

14

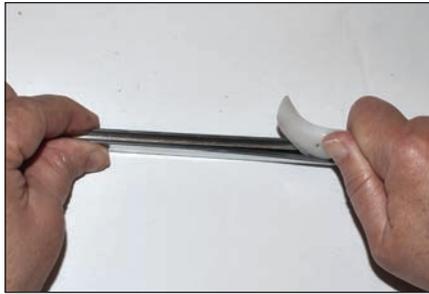
Frame the panel using the 1/2" U-channel zinc came.



Mark the direction of the cut on the zinc before using the 2" cut-off saw.

15

Open the channel on the zinc came with a plastic fid or Lathekin.



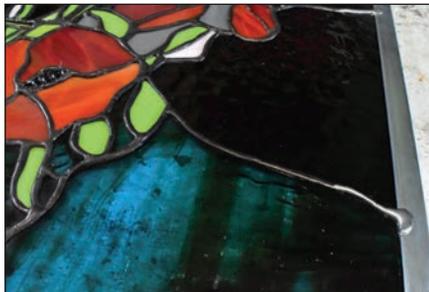
Use horseshoe nails to secure the panel when adding the zinc.

16



Apply flux where the soldered lines meet the zinc and solder.

17



18

Scuff up the zinc with a Scotch-Brite pad before adding JAX Pewter Black to the zinc.



Since this is a larger panel, I asked my husband to frame it in wood. This project is now complete and will make a beautiful addition to your own decor or a great gift for that special someone.

GPO

Cindy Dow Savary has always had a passion for art and has been a crafter all her life. After retiring in August 2017, Cindy took her first stained glass class in April 2018, and by June 2019, her work was exhibited at the City of Round Rock Texas Library. From that showing, Cindy received her first commission to repair a piece that would become part of a new Airbnb called Anabella's Studio in Round Rock, Texas. The client, Lisa Loftus-Adams, wanted to honor the memory of her friend Charlie, the original artist.



Cindy has continued to create panels to honor the memories of loved ones including her mother, who died in 1959. With the help of a friend, Michal Adams, Cindy was able to create a panel after one of her mom's oil paintings, Zinnias in a Vase. For more of Cindy's work, visit [www.instagram.com/cindy.savary77](http://www.instagram.com/cindy.savary77) or go to [www.facebook.com/APassionForGlassByCindySavary](http://www.facebook.com/APassionForGlassByCindySavary).

Jenny Westphal has worked with stained glass for over 14 years. She learned the copper foil method initially, then ventured into lead channel work and spent 10 years learning to restore and repair old stained glass windows. Jenny also designs and creates custom windows for local customers and home builders.



Three years ago, Jenny started selling stained glass and supplies and continues to expand her inventory and glass offerings. She thoroughly enjoys sharing her love of glass with her customers, and they love the personal assistance they receive in glass selection, something that is typically hard to do online. Jenny makes the process easier and more personable by messaging, sharing photos of actual glass pieces available for purchase, and providing advice on offerings from multiple glass manufacturers. Visit [www.riverhouseglass.com](http://www.riverhouseglass.com) to find out more about Jenny and her offerings.

# Reproducing Patterned Glass for Leaded Window Restoration

## Creating Replacements with Castable Refractory Molds

by Mark Lauckner



### Glass

Replacement Glass to Match  
Original Glass

### Tools and Materials

Coroplast® Signboard  
Modeling Clay  
Silicone Mold Release  
Castable Refractory Mold Material  
Kiln Shelf or Bisque Fired Ceramic  
Tile Glass Cutter  
Spoon

Sometimes when restoring older leaded glass windows, we need to replace pattern glass that can no longer be sourced. In this tutorial I will be demonstrating the use of “castable refractory” as a permanent mold material for reproducing the original glass pattern using a kiln.

Refractory molds can be reused many, many times, unlike plaster mold mixes. Occasionally the mold may need a fresh wash of shelf primer, but it must be very thin. Multiple applications will eventually fill in the small details in the design.

Castable refractories are powdered ingredients that are formulated for use in high-temperature applications such as smelters and cement plants. When mixed with water, the material behaves much like wet cement but is able to withstand 3000°F. The material is typically not yet used in the kiln glass world, but it does indeed have many applications as a more resilient alternative to plaster in mold making and kiln casting.

The best castable refractory to use is called a “dense” castable and is usually in the 3000°F range. There are several different brand names, and they all perform in a similar way. Castable refractory is not the same as high temperature brick mortar or kiln brick cement. There are refractory suppliers in all major cities, and the cost is approximately \$50 for a 50-pound bag. It does have a shelf life and is only useful for approximately one year after the manufacture date stamped on the bag.

1

*Remove and clean the glass you would like to replace.*



2

*Place some modeling clay or plastic signboard material around the perimeter of the original glass piece.*



This should be just slightly lower in height than the glass thickness and will provide even edges, which will be easier to cut off of the finished piece later. Cracked glass pieces from the original glass piece can be carefully fit together, since the modeling clay helps to secure them in place.

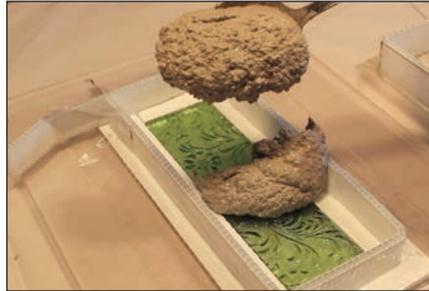
*Tape the plastic dam pieces around the outside of the modeling clay to contain the wet mold mixture.*

3



*Prepare the refractory mold material, then spray the original glass piece with mold release before filling the mold.*

4



Sift the refractory mix through a kitchen colander to remove the larger pea-sized pieces to produce a finer detail. After securing the plastic dam around the glass piece, mix the refractory powder with just enough water to make it fall off the spoon when held on its side. Too much water can weaken the mix, and too little water can cause uneven hardening.

Before filling the mold, spray the glass piece lightly with a silicone mold release. The release will oil and "wet" the surface and make the material flow better with less potential to trap air bubbles in the small areas of the glass design.

5

*Fill the mold with approximately 3/4" inch of the refractory material.*



After filling the mold, vibrate the castable material repeatedly over the entire surface by pressing the back of the spoon down into the wet mix until you can feel it knocking the glass. This forces the heavier material to go under any trapped air bubbles.

6

*Let the mold cure completely, then fire it before pouring shelf primer over the mold.*



Set the mold aside to harden for 24 hours, then strip off the dam sides and carefully remove the glass. The mold needs to air-cure for at least 5 days before firing it to 1400°F at 300°F per hour. After the mold is fired and cooled, examine it to see if there are some areas where you need to gently scrape off any thin lines that might have been caused by the earlier fitting together of cracked pieces, for example. Next pour a thin mix of shelf primer over the mold to ensure that there are no resulting brush strokes. The mold is now ready for the replacement glass.

*Place the glass piece that will eventually replace the original glass on the mold and "press fire" it.*

7

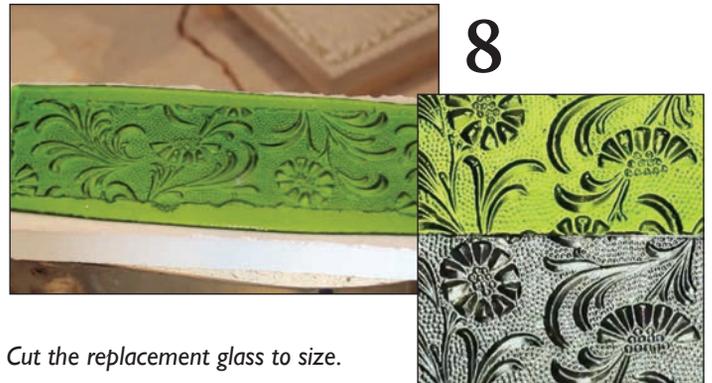


In this example I am using a different shade of green, because I would like to indicate which is the original and which is the copy. Cut a piece of glass at least 1/2" wider than the molded piece and place it on the mold. Next place a piece of primed kiln shelf or bisque-fired ceramic tile on top of it. This bit of weight prevents the edges from pulling in and thickening. It also helps to press the glass down into the design areas of the mold without becoming elevated by trapped air.

*\*\*A word about "press firing"\*\** Too much weight contributes extra mass to the firing and will lengthen the time required to reach a useful temperature, because all of that extra mass also needs to become just as hot as the mold and the glass. Also, the extra mass can result in uneven cooling, because it will hold more heat and hold it longer as the surrounding mold and kiln cools. The glass doesn't need much weight at all, since it will press down and conform to the mold details when it reaches the melting point. The work being done is more a result of time and temperature than pressure.

Fire the piece at around 350°F per hour to 1450°F and hold for 20 to 30 minutes, then off. Let the piece cool slowly inside the kiln overnight.

8



*Cut the replacement glass to size.*

After the glass is removed from the cooled mold, wash off the shelf primer dust. If the "pressing" tile or kiln shelf has left a dull surface on the upper glass surface, I will often fire it again on the mold to 1300°F with the top surface exposed to "fire polish" it and remelt the surface contacted by the upper mold part (pressing tile). After that has cooled, I cut out the piece along the edges defined by my original's size.



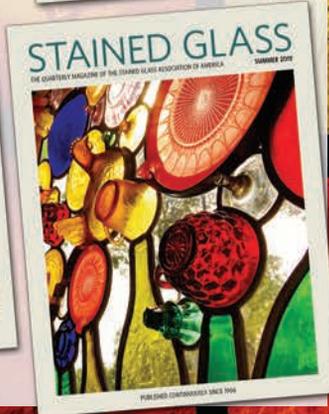
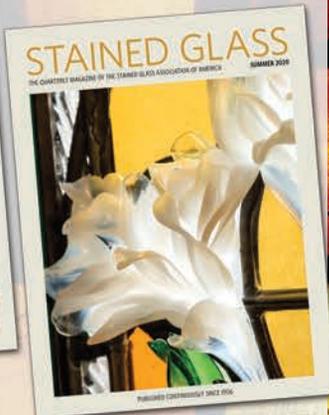
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Now I have it—a perfect reproduction of my original surface pattern and shape to insert back into the leaded window being restored. If these examples were the same color, it would be virtually impossible to determine which was the original! **GPO**

Mark Lauckner has been working in glass since 1977, first in stained glass, then lampworking in 1979, warm glass in 1984, and hot glass since 1996. He has operated The Glass Factory, a production hot shop and fusing studio, for 26 years along with an adjacent gallery located on Salt Spring Island, British Columbia, the “arts mecca” of Western Canada.



The artist has remelted over a quarter of a million pounds of scrap glass and created over 180,000 cast and pressed glass items. His iconic line of marine and rainforest themed recycled glass giftware is available in 70 galleries and gift shops across North America. He has also redesigned equipment used in warm and hot glass studios to make them more energy efficient.

Mark’s glass furnace designs have been in use in over 30 countries for 20 years. Being completely self-taught, he has developed “outside the box” glassmaking processes that have not been seen elsewhere, notably bending the rules in warm glass. Mark has also instructed dozens of kids and adult summer classes annually at The Glass Foundry since 1998 and has produced over 100 tutorial videos for warm glass, hot glass, equipment building, and mold making. For more info on Mark Lauckner and his work, visit [www.theglassfoundry.com](http://www.theglassfoundry.com) and [www.facebook.com/MarkLaucknerGlass](http://www.facebook.com/MarkLaucknerGlass).

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### Mark Lauckner Tutorials

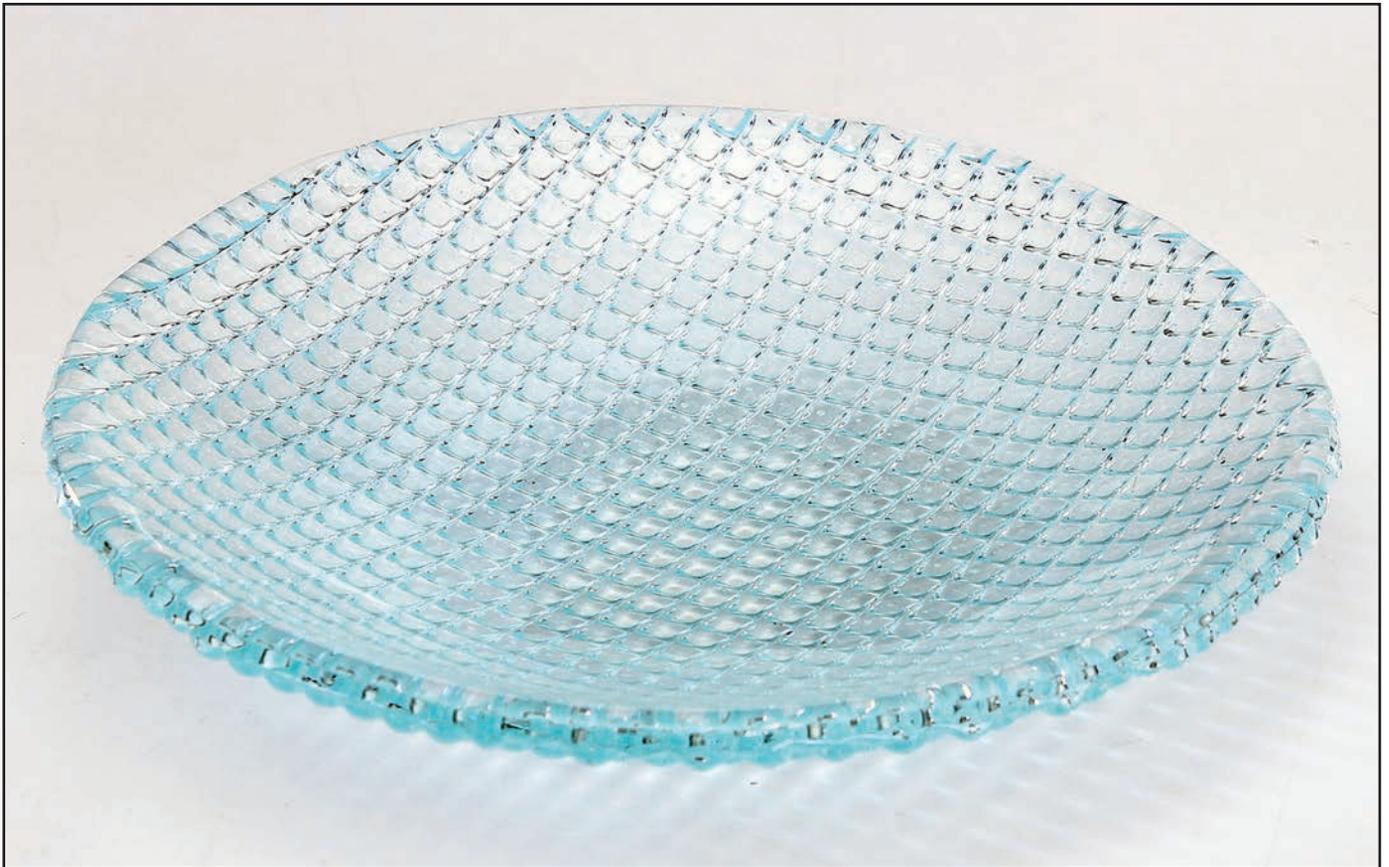
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# Bumple Glass

Design, Fabrication, and Text by Dennis Brady



Experimenting with firing glass onto a steel screen, I discovered that firing the glass to a full fuse would cause the glass to form a uniform pattern of small round bumps where the softened glass slumped through the mesh. I call this technique “Bumple Glass.”

Stainless steel screen is always best, but because the metal is thoroughly covered with kiln wash, you can use any material that will survive the full fuse kiln firing. **\*\*Do not use aluminum or anything galvanized.\*\***

The metal mesh must be a gauge that is thick enough to carry the weight of the glass. Remember that just as the glass will soften when heated, so will the metal mesh. The spacing must be large enough to allow the glass to slump into the openings but not so large that the glass will sag a lot more than you want it to. I recommend at least 1/4" mesh.

## Glass

1/4" (6 mm) Thick Clear Glass

## Tools and Materials

1/4" Gauge Stainless Steel Mesh Screen

Haik Brush or Soft Bristle Brush

Kiln Wash

Cookie Tray

Piece of Wood

Bristle Brush or Old Toothbrush

8" Round Mold

Boron Nitride Spray (optional)

## Preparing the Screen

It is essential to thoroughly apply kiln wash to the metal screen. Clean the screen first with warm soapy water to be sure you have removed any oil or other contaminants. Mix your kiln wash thin. I prefer 5 or 6 parts water per one part of kiln wash.



1

Apply 4 coats of kiln wash to the screen.

With a hair brush or soft bristle brush, apply a coat of kiln wash. When the first coat is completely dry, apply a second coat. Continue with at least 4 coats of kiln wash. More is even better. It's a good practice to apply each coat on a different brush angle. Apply north-south on the first layer, east-west on second, then diagonal on the third and fourth applications.

A handy trick for applying kiln wash is to place the mesh on a piece of tin foil or a cookie tray to catch any drips on your kiln lid when the kiln is firing. The hot kiln will heat the metal, which will cause the kiln wash to dry quickly.

You can spray on boron nitride or kiln wash, but I prefer to brush on kiln wash. I prefer this because the process of applying it with a brush leaves some kiln wash in the corners of each opening. This extra kiln wash encourages a more rounded bubble and reduces the likelihood that the fused project will be fused to the screen.



2

Use a hair dryer to prevent any film from forming across the openings of the screen.

On small space mesh, the wet kiln wash will often form a film right across the opening that, when dried, leaves a coating of kiln wash. You don't want this and will either have to remove any that forms or prevent it from happening. Blow drying right after applying the kiln wash is an easy way to prevent it.



## Different Firing Schedules for Different Size Screens

The larger the grid opening size, the larger the bumps will be. It's important to remember that in firing glass to drape or slump temperatures, the larger the span, the faster the glass will drop. Glass fired on a screen with 1/2" openings won't just drop twice as fast as on a screen with 1/4" openings but will do it 4 times as fast. The surface area of a 1/2" square is 4 times that of a 1/4" opening.

A slump fired to 1450°F worked perfectly on a 1/4" screen, but 1475°F was too high. On a 1/2" grid screen, the same full bump effect will be produced at 1350°F. Firing higher is likely to embed the glass to the screen. It's always safer to fire to a little lower temperature and settle for slightly smaller bumps. Firing higher risks ruining both the glass project and the screen.

3

Determine which firing schedule is appropriate for the gauge screen and size bumps you want.



Lower temperature firing will produce some texture, but maximum texture will be produced at full fuse temperature. The smaller the spacing in the mesh, the higher the temperature will be needed to make the glass slump into the openings.

Resist the temptation to fire higher or longer to produce bigger bumps. If the glass melts too far down through the screen, you won't be able to get it off the screen. Better to fire a little less and have smaller bumps than to have the mesh permanently embedded in the glass.

## Volume Control Issue

4

Cut 2 pieces of the clear glass to fit the 8" round mold, place it inside the mold, and fire on the screen.



To control the bump pattern, start with 1/4" (6 mm) thick glass that will not move to become thicker or thinner. You can either use 2 uniform layers or full-fuse the project before firing on the screen to create the bump pattern. If you fire with thinner or thicker glass, the pattern will distort as the glass changes size.

## Tips for Grid Alignment, Screen Sag, and Slump or Drape Firing

It makes no difference with a round project, but if you're doing a square or rectangular project, you should take special care to ensure that the edge of the glass either lines up with the wire grid or is set at some specific angle—perhaps 45 degrees.

The weight of the glass will cause the mesh to sag resulting in the glass not being fully flat. You can fire to a low temperature slump to flatten it or just place it in or on a mold to be slumped or draped so it will adopt the shape of the mold when fired.

If you fire with the bumps facing out, you will retain the rounded bumps, but if you fire with the bumps pressing against the mold, you will slightly flatten the bumps. The higher the temperature, the more you will flatten them. A low temperature slump firing at 1200°F will minimize the amount of flattening. A 30 minute hold will ensure a full slump or drape. A drape can be fired at 1150°F.

## Varying Bump Sizes

Lower temperature firing will produce shallow bumps and higher temperature firing will produce deeper bumps. You might find the larger bumps produced by higher temperature firings more attractive but higher temperature firings increase the possibility the glass will stick to the screen. Here are samples of bumps created by firing at different temperatures.

Bumps created firing to 1300°F



Bumps created firing to 1325°F



Bumps created firing to 1350°F



## Reusing the Screen

Kiln wash cannot be trusted in a second firing at temperatures above those for slump firing. You must remove all of the old kiln wash and apply new coats for the next firing. It's not a big deal and only takes about one minute to scrub off with water using a bristle brush or old toothbrush. If you take care to thoroughly clean after each use and don't fire so hot that the screen attaches to the glass, you can expect to get dozens (perhaps hundreds) of uses from your screen. **GPO**

## Firing Schedules

### Schedule for Bumps on 1/4" Grid

Segment 1: Ramp 400°F/hr to 1000°F and hold 20 min.  
Segment 2: Ramp 900°F/hr to 1350°F and hold 20 min.\*  
Segment 3: Ramp 9999 (AFAP\*\*) to 960°F and hold 30 min.  
Segment 4: Ramp 400°F/hr to 300°F and no hold.

### Schedule for Bumps on 1/2" Grid

Segment 1: Ramp 400°F/hr to 1000°F and hold 20 min.  
Segment 2: Ramp 900°F/hr to 1450°F and hold 20 min.\*  
Segment 3: Ramp 9999 (AFAP\*\*) to 960°F and hold 30 min.  
Segment 4: Ramp 400°F/hr to 300°F and no hold.

### Schedule for Slumping into Mold

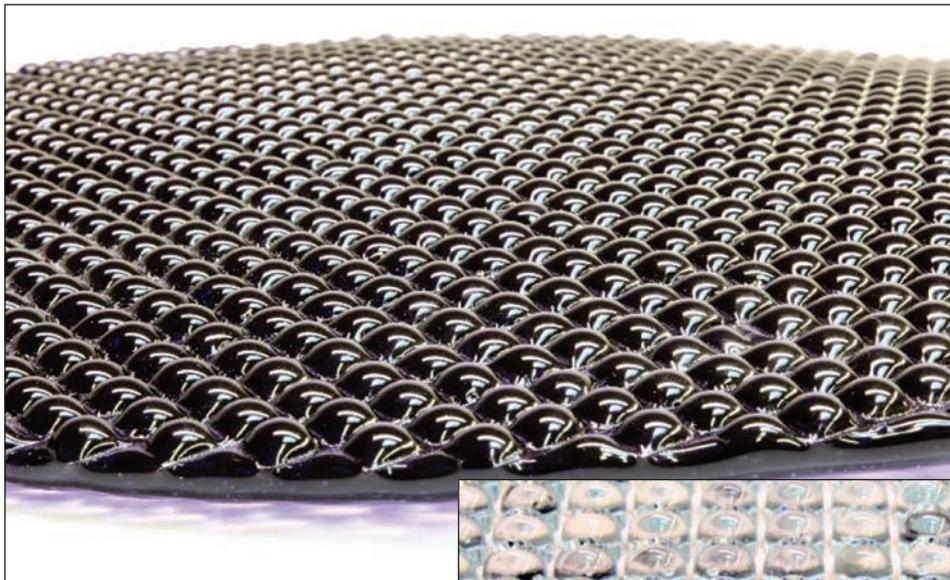
Segment 1: Ramp 400°F/hr to 1000°F and hold 20 min.  
Segment 2: Ramp 900°F/hr to 1200°F and hold 30 min.\*  
Segment 3: Ramp 9999 (AFAP\*\*) to 960°F and hold 30 min.  
Segment 4: Ramp 400°F/hr to 300°F and no hold.

### Schedule for Draping over Mold

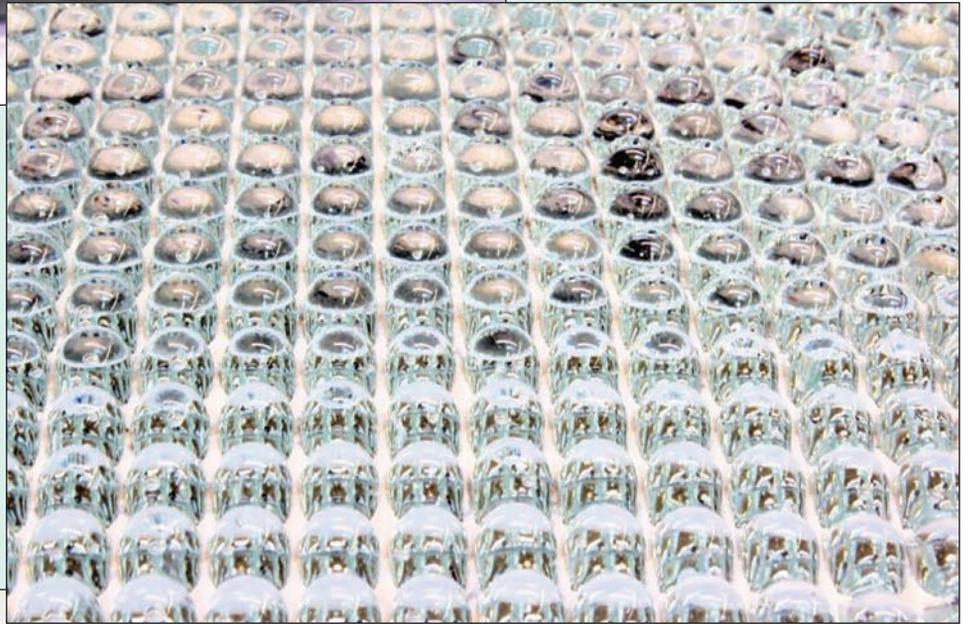
Segment 1: Ramp 400°F/hr to 1000°F and hold 20 min.  
Segment 2: Ramp 900°F/hr to 1150°F and hold 30 min.\*  
Segment 3: Ramp 9999 (AFAP\*\*) to 960°F and hold 30 min.  
Segment 4: Ramp 400°F/hr to 300°F and no hold.

\* Top temperatures are for COE 96 glass. For COE 90, add 20 degrees.

\*\*as fast as possible



Fired to 1450°F  
on 1/4" grid screen



Fired to 1475°F with  
glass stuck to screen



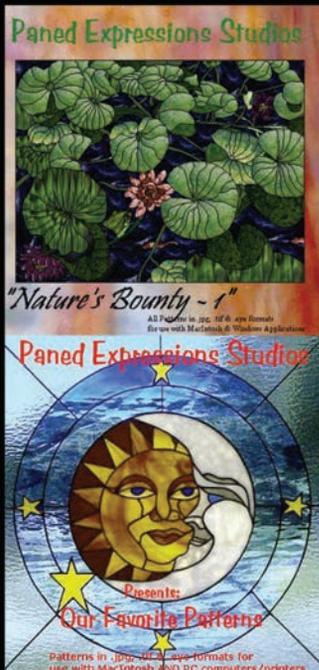
Close-up view of overfired  
project with the glass bumps  
bulged and mushroomed  
over the screen



Dennis Brady has been a full-time professional glass artisan since 1980 and currently works with stained glass, fusing, casting, glassblowing, and sandblasting. He has authored and published six books of stained glass patterns plus *A Lazy Man's Guide to Stained Glass*. Along with his sons, Dane and Jason Brady, he operates several companies. DeBrady Glassworks produces glass art; Victorian Art Glass sells tools, equipment, and supplies; and Master Artisan Products manufactures molds and tools for glass artisans. He has also created the website *Glass Campus*, which offers over 100 tutorials and videos teaching numerous glass art techniques as well as tips on how to make a living as a glass artisan.

Dennis teaches extensively in his home studio in Victoria, British Columbia, Canada, and as a guest instructor in several other countries. He is also a contributing artist to GPQ's live and recorded *Glass Expert Webinars™* and *Master Glass Artisan Lecture Series™*. His "push the boundaries" approach to experimentation and innovation is always, "How fast can I go until I skid into the ditch?" Visit [www.debrady.com](http://www.debrady.com) to learn more about Dennis and his art.

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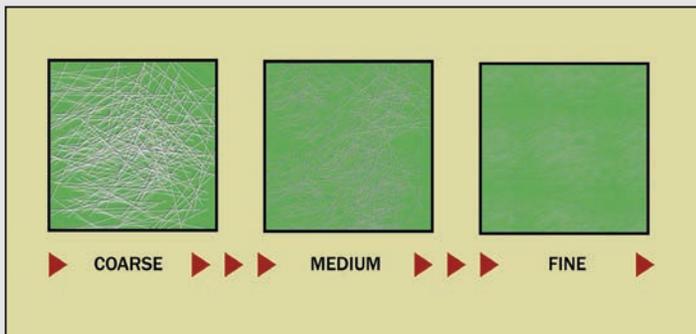
Phone - 309-266-5712

# Grit Theory in Cold Working Glass

by Paul Tarlow

The basic idea behind most cold working is that a coarse abrasive is used to first shape glass by literally scratching it away from unwanted areas. Those scratches are then erased with a slightly finer abrasive. Step by step, scratches are removed with progressively finer scratches until they cannot be seen without magnification.

The coarseness of abrasives is described in terms of the size of the screen or mesh through which the particles will pass. For example, 60 grit abrasive is considered quite coarse and 600 grit is very fine. If you have ever used sandpaper to finish wood, then you are already familiar with this system. Glass adds pumice and cerium oxide to this sequence. Pumice is finer than 600 grit but not as fine as cerium oxide.

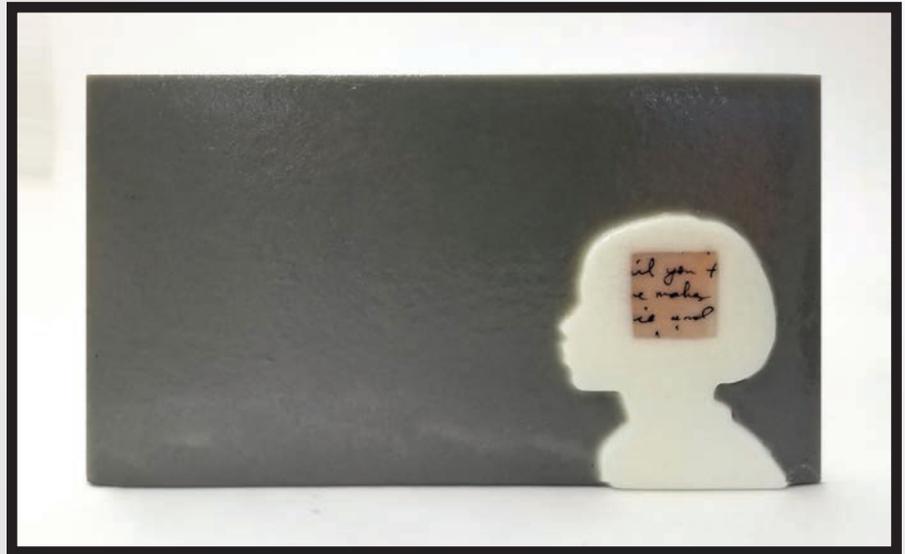


Step by step, scratches are removed with progressively finer scratches until they cannot be seen without magnification.

## Selecting the Appropriate Grit Sizes and Sequence

Choosing a sequence of abrasive grit sizes is perhaps the most vexing aspect of the entire cold working process. Should you start with 60 grit or 120 grit? Should you stop at 600 grit or pumice? Which grits are used between the starting and finishing grit?

Asking experienced cold workers for advice is a lot like asking friends for driving directions. Three different people will typically give you three different answers. In most cases, all three directions will get you to your destination. None are wrong, but each is based on personal experience. Drive the routes enough times, and you'll develop your own preferences.



Paul Tarlow, *Looking West*, 11" x 6" x 3/4", 2017.

Photo by Karen Paquette.

Similarly, you can use different grit sequences to turn a misshapen piece of fused glass into a beautifully finished bowl. One route might include 60, 220, 400, and 600 grits before cerium oxide. Another might jump from 120 to 600 grit and finish with pumice.

The following two grit sequences illustrate two different approaches.

- Option A: 60, 120, 220, 400, 600, pumice, and cerium oxide.
- Option B: 60, 220, 600, and cerium oxide.
- The amount of time spent at each step in option A is relatively small, because the difference in grit size is small. The incremental change in the surface is also small. You will spend more time at each step in option B, because the change in grit size is greater. So which do you choose? Here are some things to consider.
- More steps require a larger selection of silicon carbide grit sizes and/or diamond pads. The cost is offset by the fact that each abrasive will last longer, because each is being used less.
- Every grit change requires some amount of cleaning, rinsing, and preparation. The effort for diamond pads is trivial. When working with loose grits, the grit change process is messy and more time consuming.
- The bigger the difference between grit sizes, the less effective and efficient the grinding. You can, for example, jump from 80 grit to 600 grit, but the amount of time it will take makes this impractical.
- When an oversized scratch finds its way onto your work—and it will as you are cold working—you must back up to a step with a sufficiently coarse grit to remove the scratch. If your grit sequence has fewer steps, you will likely be forced to take a larger step backwards. That means more rework.

## Guidelines for More Efficient Work

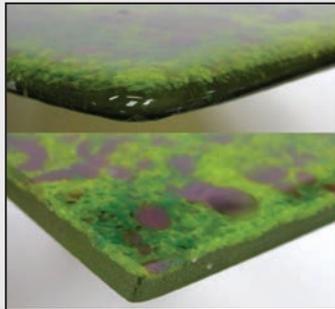
Use the following guidelines to minimize the number of steps.

- Never jump in grit sizes by much more than double the current grit size. For example, if you grind with 60 grit, the next grit size should be no finer than 120 grit.
- Use at least one of each of the following: a coarse shaping grit, a medium refining grit, and a fine finishing grit. Understanding the roles of these three categories of grit will help you come up with a suitable approach for your work.

### Coarse Shaping Grit: 200 and Below

Your first and coarsest grit does the most work in cold working. It removes the greatest amount of material to shape the glass. That shaping might be turning an irregular shape into a more exact circle or flattening a rounded edge to make it square. Often, more time is spent on the first grit than on all other steps combined.

*The first step for most cold working, and the job of the coarsest grit, is to grind your work to the final shape. All steps that follow are for smoothing and polishing the surfaces that you create in the first step.*



Use a coarse 60 or 80 grit to remove a lot of material. The advantage to coarse grit is speed, since you'll simply remove material and shape your work faster. The downside to coarse grit is that it can create deep scratches and small chips that are more difficult to eliminate with finer grits in subsequent steps. Also, with speedier material removal, you will create mistakes more quickly, although this is a much bigger concern when using motorized equipment.

### Medium Refining Grits: 200 to 600

After you shape the glass, use a medium grit between 220 and 600 grit to begin the process of smoothing the surface. The goal is to take the surface from the rough, frosty finish that you created with the coarse, shaping grit and refine it into a smooth, but not yet shiny, finish. For most cold working tasks, one or two medium grits is sufficient.

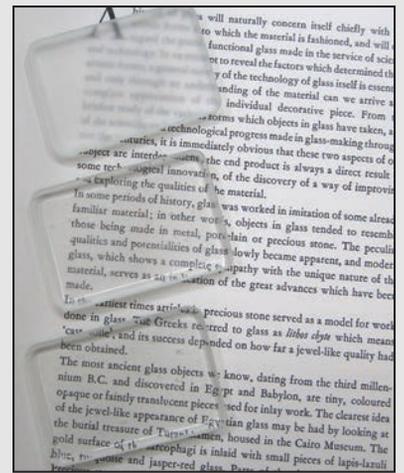
*The goal of the medium grits is to smooth the surface so that no more scratches are visible to the naked eye. Even after 600 grit, as shown here, the glass does not have a glossy, reflective finish. That is the job for the polishing grits.*



### Fine Finishing (Polishing) Grits: 600 and Above

Not all cold working ends with a shiny, high gloss finish. For most glass artists, a 600-grit finish is the minimum for considering the work finished. A proper 600-grit finish has a somewhat diffused shine but without visible scratches. Particularly on opaque colors, finishing with 600 grit leaves a sumptuously soft, glare-free surface.

*This image shows three attractive, but different, finishes on clear glass: (top to bottom) 600 grit, pumice, and cerium oxide.*



After completing the 600-grit surface, you can continue with pumice or move immediately to cerium oxide. Polishing with pumice gradually changes the glass from the 600-grit finish described above to a near “optical” surface, one where the glass becomes “invisible” except for any glare, and the interior of transparent work is unobscured. You can choose to stop at any point during this change.

Even if you want a true optical finish, polishing first with pumice increases your chances of correcting flaws that were not visible at 600 grit but will be glaring after polishing with cerium oxide. In fact, any remaining scratches or texture will show vividly on a high gloss surface produced by cerium oxide.

## Diamond versus Silicon Carbide

Occasionally, the task at hand can only be accomplished by either silicon carbide or diamond. More frequently, both are options, and you will have to choose.

For removing lots of glass using coarse grit, diamond removes glass faster than the same size silicon carbide grit. There are two closely related reasons for this. Diamond is harder than silicon carbide, so a single grain of 80-grit diamond is more effective than a single grain of 80-grit silicon carbide. Additionally, silicon carbide breaks down more quickly than diamond. Your 80-grit silicon carbide sandpaper, for example, gradually becomes 100 grit, 200 grit, and so on.

Many accomplished glass artists prefer the silicon carbide finish over a diamond-ground surface. When you ask them why, you are likely to hear something like, “Diamond leaves a more mechanical finish.” The difference is subtle and impossible to show in a photograph. Most glass artists who cold work recognize that silicon carbide and diamond cold working tools both serve important roles.



*Diamond surfaces are available on hand pads (left), disks (right), and files (center) as well as other formats.*



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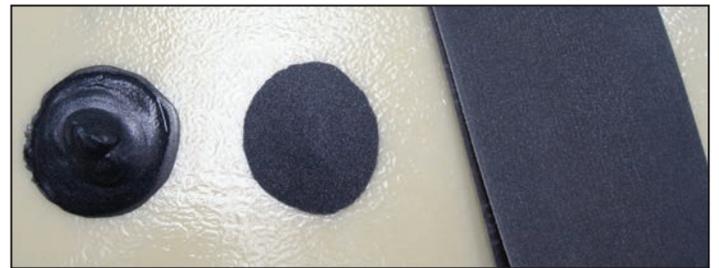
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Many silicon carbide cold working techniques require loose grit. Moving from one grit to another requires considerable care. A single piece of 120 grit, for example, will ruin your 400-grit finish and send you back one or more steps to remove the scratch. Diamond cold working is almost always done with the diamonds bound to pads and tools. Loose bits of diamond material are rare.

Lastly, diamonds tend to be less forgiving than silicon carbide. Silicon carbide is always a mix of grit sizes, because finer grit is continually produced as the grains fracture into smaller pieces. As a result, scratch removal begins even before you move on to finer grits. Diamond grit size tends to be—and stay—more consistent, so stray marks are more obvious.

As with most things in life, becoming a skilled cold worker requires practice. With cold working, taking time to carefully observe changes to the glass will help you develop an eye for quality and recognize defects earlier in the process when they are easier to correct. The result is much better glass with the least possible effort.

GPO



Silicon carbide in 120 grit is shown here in three forms: (left to right) slurry (wet grit), dry grit, and glued to paper backing (sandpaper).



Paul Tarlow, who is widely acknowledged as an authority on kiln formed glass, has written a series of e-books on a wide range of topics related to kiln formed glass available at [fusedglassbooks.com](http://fusedglassbooks.com) and is known to be a generous instructor. He also runs [www.fusedglass.org](http://www.fusedglass.org) as well as Fused.Glass, a closed corollary Facebook group, at [www.facebook.com/groups/fusedglass](http://www.facebook.com/groups/fusedglass).

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# Fantasy Fishbowl

*Design, Fabrication, and Text by Mary Sherwood*



Do you remember having a goldfish bowl as a child? I certainly do! I was so excited to pick out the perfect goldfish and add the colorful sand and plastic plants to decorate the bowl. The brightly colored goldfish was the first pet I learned to take care of. That is the inspiration for the Fantasy Fishbowl. Once you fill your fishbowl, I guarantee this will be the easiest-care fishbowl ever!

My love for anything that includes a water feature comes from my upbringing along the Chesapeake Bay. Now that I have established roots in the Sonoran Desert of Arizona, I still long for the peacefulness of being around water. Reflecting in water brings peace to the soul. Reminiscent of a childhood goldfish bowl, this piece brings a small element of sea-life serenity inside.

Before you begin to cut your glass shapes, collect the design elements you plan to use to embellish your fishbowl. If you do not have premade dots, frit lace, and vitrigrph stringers, now is a good time to make them. You will then be able to proceed with adding the layers of elements to the piece once the larger glass pieces are cut.

The curved cuts on the base glass pieces can be any gentle S curve you desire. See the pattern for the shapes used here. The important part is to cut your pieces in order, steps 1 through 4, so they will all fit together. Then you will be ready to add the fun stuff by layering all different kinds of embellishments. You are the artist. Create your own fabulous fishbowl design.

## Glass

Clear Glass for Base, 10" Diameter Circle  
Icicle Clear Transparent Iridized for Fishbowl Top, 5" x 12"  
Clear Reeded Glass for Fishbowl Center, 4" x 12"  
Caribbean Blue Solid Transparent  
for Fishbowl Bottom, 6" x 12"  
Dark Blue Medium Frit  
Sky Blue Medium Frit  
Peacock Green Medium Frit  
Assorted Pale Blue, Turquoise, and Clear Vitrigraph  
or Stringers  
Assorted Clear, Ivory, Dark Blue, and Peacock Green Beads  
Glass Scrap in Desired Colors for Fish

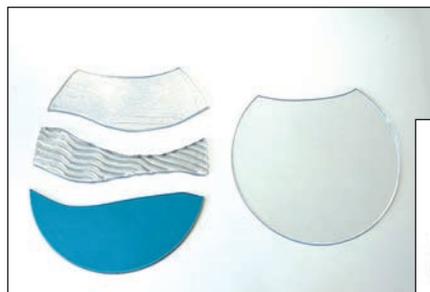
## Tools and Materials

Glass Cutter  
Running Pliers  
Black Sharpie  
Elmer's® Clear Gel Glue  
Nonaerosol Hairspray  
Mosaic Nippers  
Kiln Paper or Prepared Kiln Shelf  
Protective Eyewear  
Work Gloves  
Flame Retardant Gloves  
Tinted Safety Glasses  
with Protective ANSI Shade 1.7 Lenses

## Preparing the Base Glass

1

Cut one 3 mm clear 10" circle from the fusible ICE glass and cut out an oval piece 1-1/5" x 6" at the top.



Cut out the colored, textured, and irid glass to match the pattern and assemble them on top of the clear circle.

2



Cut the bottom piece out of the 3 mm Caribbean Blue with a wavy line on top as shown in the pattern. Next cut the textured 3 mm clear ribbed or wavy glass with a curved shape on the bottom to marry with the lower blue glass. This piece will resemble water ripples. Cut the top of this piece with a complementary curve as shown in the pattern.

Now cut the top section out of Clear Gold Irid or clear glass to fit into the curve of the ribbed glass and match the cutout on the top of the 10" base circle. If using irid glass, apply with the irid side up. Although you can follow the pattern for these cuts, you can also cut similar S-shape cuts to your liking. Apply the blue, clear reeded, and irid glass pieces to the clear 10" circle.

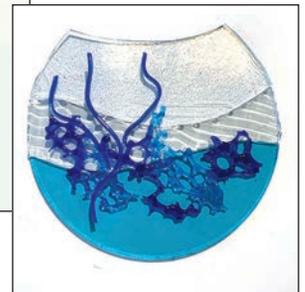
## Making the Embellishments

Next come the layers of embellishments. Build an arsenal of these elements if you like to create pieces with visual and tactile interest. Many are very easy to make.

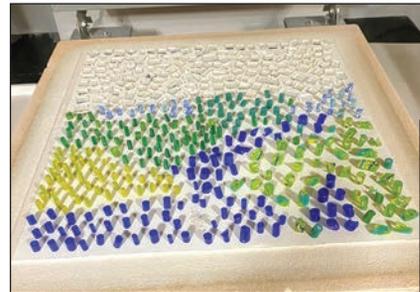


Collect all the various elements and try out different combinations.

3



By spending time at this point, you will begin to see how the composition changes. Select elements and their placement that are pleasing to your eye.



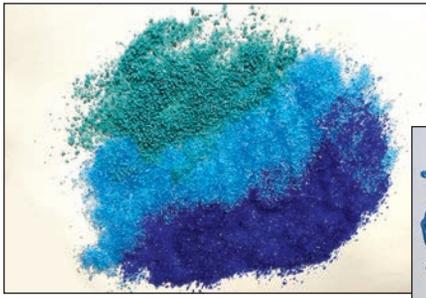
Make lots and lots of beads for this and many other applications.

4

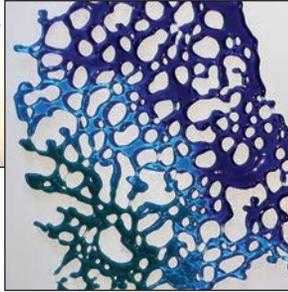


We are using an assortment of clear, white, blue, and green. Beads can be made from squares of glass, random small scraps of glass, and vitrigraph cuts. For this application, cut strips of glass in 3/8" widths, then cut them into 3/8" squares.

Make sure you have enough clear beads to finish the curved top of the bowl to create the rim of the fishbowl. You will need approximately 15 clear beads for the rim plus extras for clear bubble accents. Place the glass squares in a single layer on a prepared kiln shelf or firing paper. The placement of the beads is discussed in other steps. Follow the Bead firing schedule at the end of the tutorial.



5



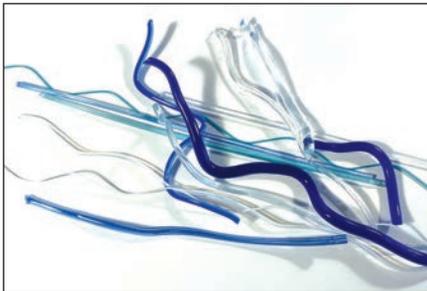
Make frit lace using Dark Blue, Sky Blue, and Peacock Green medium frit.

Spread the frit in a thick layer on a lined or primed kiln shelf and full-fuse using the frit/bead firing schedule. I do not use a certain ratio of frit. Sometimes the finished product is denser than other times. You will get the feel for the quantity of frit to use. The glass will shrink as it fires and create crater-like openings. Carefully clean the back of the panel.

There will be sharp spikes and other potential hazards, so be sure to wear gloves and eye protection when cleaning and breaking the frit lace into pieces. It can be broken by using nippers or by gently tapping, then breaking with protected hands. Very sharp in spots!!!

It's a very fast firing schedule, so you can create frit lace whenever the need arises. Be careful not to mix too many colors together. Some colors may react and not create a pleasing finish. Frit lace adds such an interesting pattern and texture! Fire using the frit lace schedule.

6



Use mosaic nippers to cut the curvy vitrigrph or stringer into accent pieces with mosaic nippers.

Use assorted curly vitrigrph cane and stringers, either purchased or pulled, in colors of your choice. Pale Blue, Turquoise, and Clear were used here. There are many tutorials about making vitrigrph available if you wish to make your own. As an alternative for the curvy vitrigrph accents you could use stringers formed using a torch or candle.

Cut the vitrigrph with mosaic nippers. \*\*\*Be sure to wear eye protection.\*\*\* Place the accents to appear as if they are growing out of a sandy bottom.

7

Add small fantasy goldfish and any other small sea life to simulate them swimming through the coral and grass.



The fish are created using scrap pieces of orange and multicolor stringers or noodle bits. The fish eyes are tiny beads. They don't always stay in place during firing, so make some extra fish just in case. The eyes can be painted on as well.

## Layering the Embellishments

8



Start at the bottom of the bowl and apply the assorted sizes and colors of frit.

This layer of frit should be applied to resemble a sandy bottom. Spray the frit with nonaerosol hairspray to secure. More frit can be added after the other elements are layered in if needed. Apply various pieces of vitrigrph to resemble wispy grass in the water and use glass glue to tack the vitrigrph in place.

9



Finish adding the elements to complete the design and tack-fuse them in place.

Place the goldfish and sea-creatures among the frit lace and vitrigrph. Add clear and colored glass beads throughout the other elements. Tuck them in the craters of the frit lace and anywhere else you would like more visual texture.

Add clear glass beads to the elliptical edge of the top to create the rim of the fishbowl, which will take approximately 15 to 20 clear glass beads. Finish the fishbowl with the addition of assorted frit and glass pieces as needed. Larger assorted chunks of glass and beads can be layered on top of the sandy frit base to create rocks, for example. Use glass glue to tack the elements in place as needed and use a light coat of nonaerosol hairspray to secure the frit.

The fishbowl is now ready for the kiln. Use the Tack-Slow Fuse schedule at the end of the tutorial. Because of the multiple layers of this design, the firing schedule was created to be a slow tack fuse going up to a target of 1385°F and slow going down through the anneal. With the extended time of the hold segments, this piece can be completed with one firing. Do not remove the piece from the kiln until it has cooled to 100°F. When finished, you are now ready to display this piece in a 10" round custom stand or stock stands available through glass suppliers.

GPQ

## Firing Schedules

Remember that kilns may fire differently. Please adjust these schedules to suit your own particular kiln.

### Frit Lace and Bead Schedule

Segment 1: Ramp 9999 (AFAP\*) to 1500°F and hold 10 min.  
\*as fast as possible

### Tack-Slow Fuse Schedule

Segment 1: Ramp 150°F/hr to 1000°F and hold 60 min.  
Segment 2: Ramp 150°F/hr to 1200°F and hold 90 min.  
Segment 3: Ramp 300°F/hr to 1385°F and hold 10 min.  
Segment 4: Ramp 9999 (AFAP\*) to 950°F and hold 120 min.  
Segment 5: Ramp 100°F to 800°F and no hold.  
\*as fast as possible

**\*\*Note\*\*** During Segment 3 you can “peek” to inspect the degree of texture by lifting the kiln lid briefly. Lots of texture is desired. You can choose to continue to hold at the peak temperature of 1385°F to further soften and round the elements. If the tack fuse contour is sufficient, skip to Segment 4.

**\*\*Safety Precautions\*\*** Wear cotton clothing, flame retardant gloves, and safety glasses with protective ANSI shade 1.7 lenses whenever you are looking into a hot kiln.



Mary Sherwood was born in Norfolk, Virginia, and spent much of her younger years recreating on the shores of the Chesapeake Bay. She began developing “color board” scrapbooks of clips from shelter magazines when she was eight, which led to an interior design career and progressed to creating art glass with vibrant colors and abstract designs for interior and exterior installations. Her sense of color, composition, and style that she developed as a child is reflected in her glass art. According to Mary, “Glass is an amazing medium that incorporates colors, textures, patterns, and shapes. Working with glass is a choreographed dance of art, chemistry, and science to achieve the desired result—ever changing, ever beautiful!”

The artist now resides in the Sonoran desert area of Arizona. Her work has been exhibited at multiple La Encantada Fine Art Festivals from January 2019 through November 2021. She also received the La Encantada Fine Art Festival Award for Best in Show for 3-D Art in January 2020. Mary’s work is represented exclusively by Jane Hamilton Fine Art in Southern Arizona. Visit [www.janehamiltonfineart.com](http://www.janehamiltonfineart.com) to view more of her work.

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# Functional Art Wall Clock

*Design, Demonstration, and Text by Petra Kaiser*



Glass clocks can come in all shapes and forms. Once upon a time I cut a shape for a clock and, as so often happens, got distracted. Several years later I found the piece again in a pile of glass but without a clear marking of its COE. It happened to be a color of Wissmach Glass that could be either 90 or 96. Normally I would just cut off a little piece for a COE test, but with a perfect shape like this, I didn't want to remove part of the glass.

With this predicament, I finally had a design solution—a two-part clock. In the first part, I will show you how to kiln emboss the glass with Papyros paper, and in the second part we will make a separate clock face. Then, of course, we will assemble the clock in the third part of this tutorial.

**Wissmach Glass Co.**

90-04-LU Luminescent Blue  
for Clock Background, 8-1/2" x 11"

96-57 Prisma Crystal and White  
for Clock Face, 5" x 5"

**Tools and Materials**

Papyros® Kiln Shelf Paper

Clock Movement

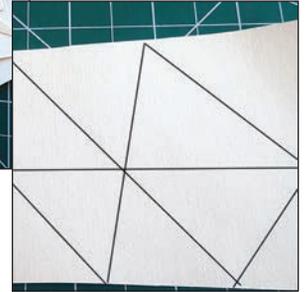
5 mm Diamond Hollow Core Drill Bit

Small Grinder Bit

White Glue

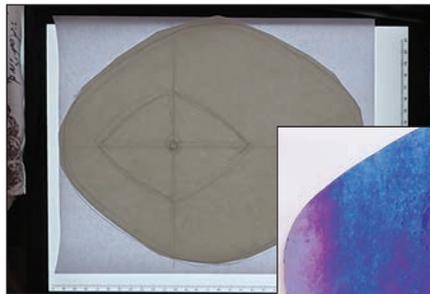
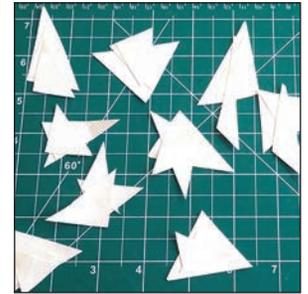


2



Prepare the Papyros paper for the triangle design.

I don't know about your studio, but in my studio I can hardly throw away any random glass pieces or even Papyros paper scraps. The big question is what kind of a design do I want on my luminescent glass. First I thought of flowers, but after a few trials I wasn't so happy with them, so I decided to do a random layout of triangles instead. In order to get the most triangles out of a piece of glass I drew them with a pencil and ruler on the Papyros paper pieces.



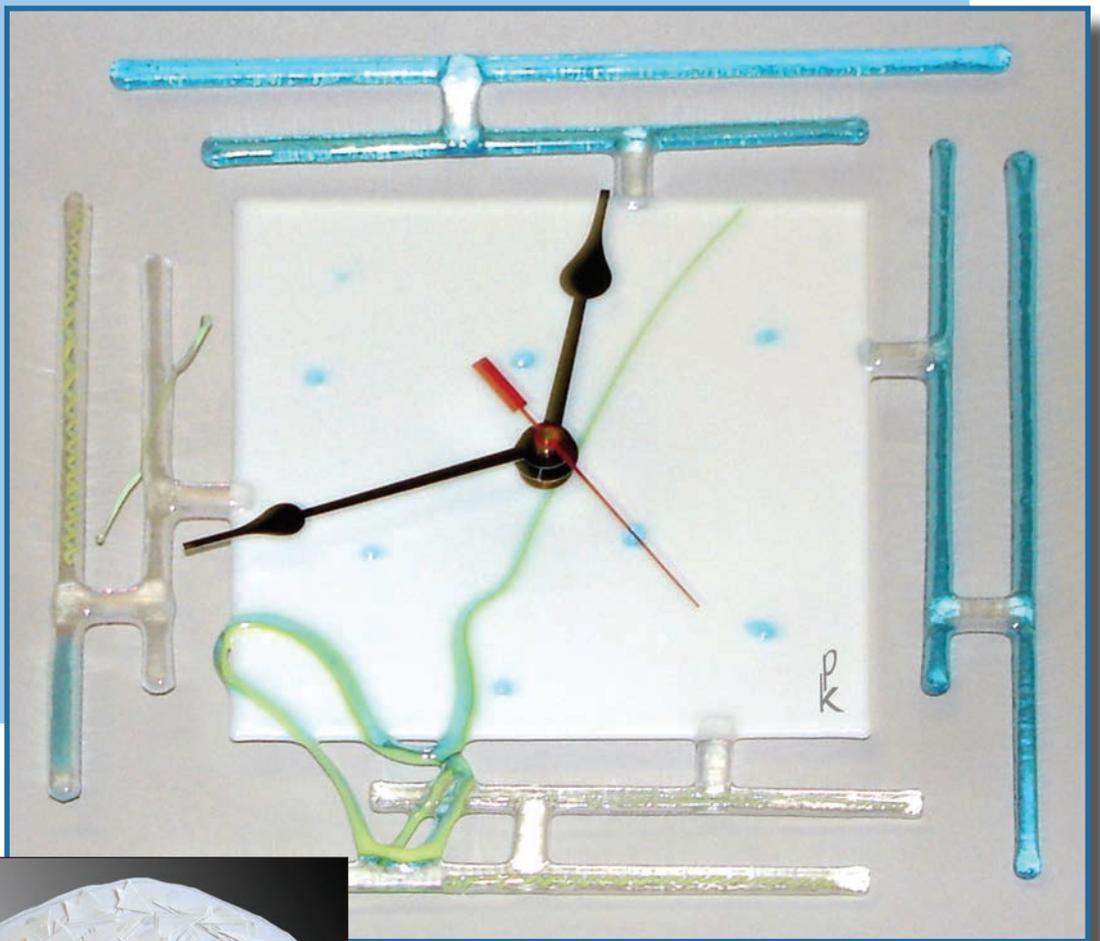
1

Design the clock.



In my case, I already had the main clock background piece. In my fusing life, I have created many different clocks and clock shapes, usually without a pattern. In this case I drew a pattern for the smaller glass part, since I wanted it to match the main glass.





3

Create the underside holder.



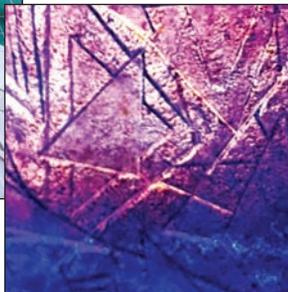
Once you have a fair amount of triangles cut, glue three of them together with a drop of white glue. These little packages will help you with your final design.

Cut out a piece of Papyrus paper as a base layer and use your glass piece to mark the outline of your glass. Don't forget to place the glass with the luminescent side toward the paper. Now you can randomly place your triangle packages on the Papyrus base.



Place the glass, luminescent side down, on the paper design.

4



As you can see, I even marked the center of the clock background in the upper part where I want to place the clock movement. Then I placed the blue glass, luminescent side down, onto the Papyrus paper construction. The effect after firing is just stunning.

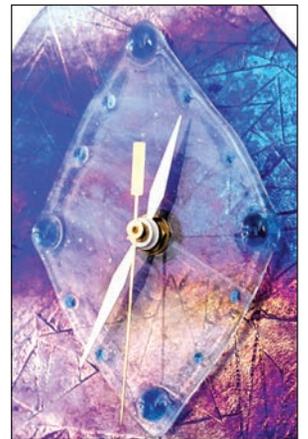
5

Create the top part of the clock.

Remember, we don't know the COE of the blue glass, so we couldn't add any other glass embellishments. Therefore, I cut a piece of 96-57 Prisma Crystal and White and added some prefused balls in place of numbers. Place both pieces in the kiln and use the following firing schedule.

#### Firing Schedule

- Segment 1: Ramp 600°F/hr to 1000°F and hold 10 min.
- Segment 2: Ramp up 9999 (AFAP\*) to 1410°F and hold 10 min.
- Segment 3: Ramp down 9999 (AFAP\*) to 900°F and hold 60 min.
- Segment 4: Ramp down 100 (AFAP\*) to 700°F and no hold.





6

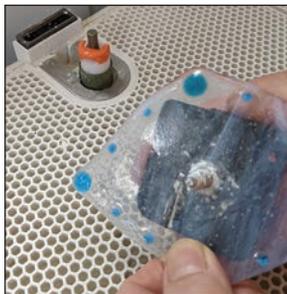
*Drill holes to prepare the fused glass for installation of the clock movement.*



I have been looking a long time for the right size drill bit to drill the hole for the clock movement. Unfortunately, I couldn't find a drill bit in the correct size. Therefore, we are using a two-part approach.

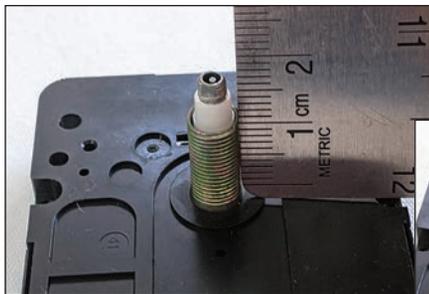
First drill a hole with a 5 mm hollow core diamond drill bit, then use the small grinding head on the grinder to open it just a bit more to fit over the clock movement. I used an old movement to test the size of the hole.

In order to drill the hole, use an old baking pan and place a piece of glass in there. Next, place the piece that you want to drill on top and fill the pan with water so that it just covers the top piece. This way, when the drill is through, it hits the same material and your beautiful artwork will not shatter from a sudden movement change.



Petra Kaiser, internationally renowned kiln formed glass artist and instructor, has a distinctive style that captures Florida sun, light, and water in sculptures, functional glassware, and wearable designs. She is always drawn to 3-D sculptures and abstract shapes, and when first introduced to glass fusing in 1997, she found the available mold options rather limiting. This gave birth to Kaiser Lee Board, a perfect kiln forming medium developed by Petra and husband Wolfgang, that is easy to cut and form into any shape for fusing molds.

Petra loves to teach and shares her cutting-edge techniques and designs with students in her Fuse It Studio and all over the world. She has also shared her innovative ideas in three books from Wardell Publications as well as through numerous articles in various international glass magazines. Visit [www.kaiserlee.com](http://www.kaiserlee.com) to learn more about Petra's glass art and workshops.

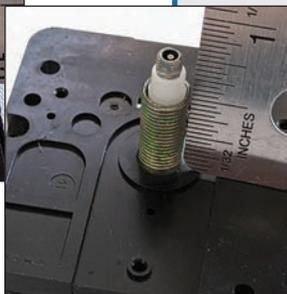


7

*Install the clock movement.*

Now all that is left is to mount the clock movement and your beautiful functional wall art is finished. In this case you will need a clock movement with a longer shaft that is 9/16" between the first and second glass pieces. We also added an additional washer and nut. I hope that I have sparked your imagination and that you will use the techniques in this article to create your own design.

**GPQ**



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# Kiln Corner Electrical Complications

by Arnold Howard

Photos Courtesy of Arnold Howard

I'm starting to realize that the most confusing thing about kilns is voltage and phase. Recently I helped a customer in Mexico whose 240 volt studio kiln would not get hot enough. "What is your voltage?" I asked. "Our electrician checked and told us it's 240." Through video chat, we tested their voltage, and their meter read 220.

"That's why your kiln won't reach temperature," I said. "Your voltage is only 220, and your kiln has 240 volt elements." "No, the customer assured me. "The electrician said there was no difference between 240 and 220." The customer still doesn't believe me.

## Problems When Kiln and Circuit Volts Don't Match

A few weeks ago I was at a private school, which had a 240 volt 2350°F crucible kiln that couldn't get hotter than 2000°F. I measured the circuit voltage, which was only 208. The school electrician came to the classroom. "The entire school is 208 volts," he said. "I didn't think it mattered if the kiln was 240 or 208."

A 240 volt kiln fires slowly on a 208 volt circuit. If a 208 volt kiln is plugged into a 240 volt circuit, however, the opposite will happen. The 208 volt kiln will receive more power than it was designed for, which can damage the elements and wiring.

The voltage rating of your kiln is listed on the electrical data plate on the side of the kiln. If you buy a used kiln, don't trust the data plate unless the kiln owner knows the complete history of the kiln. Kilns are often modified for the voltage requirements of a studio, and the new voltage is rarely added to the data plate. When converting a kiln to a different voltage/phase, write the new specs and date on the kiln's data plate with a black permanent felt-tip marker. *Don't forget that the phases of the circuit are as important as the voltage.*

When you know the voltage of your building, never assume that it is the same in every room. I visited a ceramic studio in a strip mall that had two kilns side by side. One circuit was 240 volts, and the other was 208 even though the receptacles looked the same.

## Precautions to Take When Testing Circuits

Do not test a circuit with a multimeter unless you are experienced. Always wear shockproof gloves. I know of someone who was badly shocked when testing a circuit.

One last reminder—pull out the kiln plug and check it plus the receptacle for heat damage every few weeks. One out of every seven kilns I work on has a damaged plug.

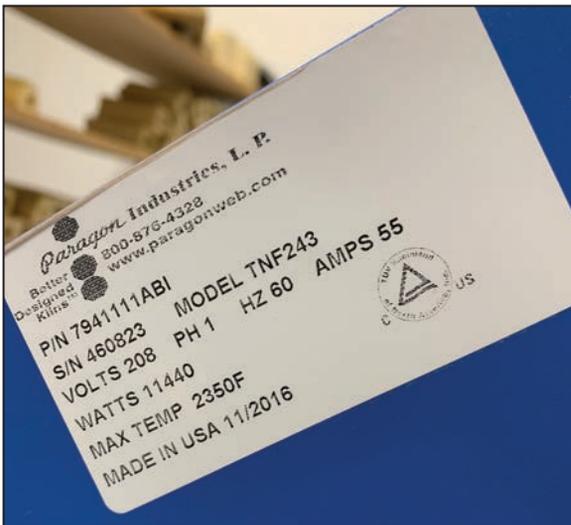
**GPQ**



Every few weeks, pull out the kiln plug and check it and the receptacle (socket) for heat damage. These photos taken during a recent visit to a high school show an example of extreme heat damage.



This 240 volt crucible kiln was rated to 2350°F, but it couldn't fire hotter than 2000°F because it was plugged into a 208 volt circuit.



The electrical data plates on new kilns are accurate. You cannot always trust them, however, when you buy a used kiln, because many kilns have been modified.

While Arnold Howard worked at Paragon Industries, he saw kiln controls evolve from switches to touch screen displays, tested early glass kilns, and wrote owner instruction manuals. He now owns Howard Kilns, LLC, a kiln repair and sales business and works on all brands of electric kilns. Feel free to contact him at [arnoldhoward@gmail.com](mailto:arnoldhoward@gmail.com) or call/text 972-333-1437.



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One Kiln Load 40" x 26" created by Donna V.

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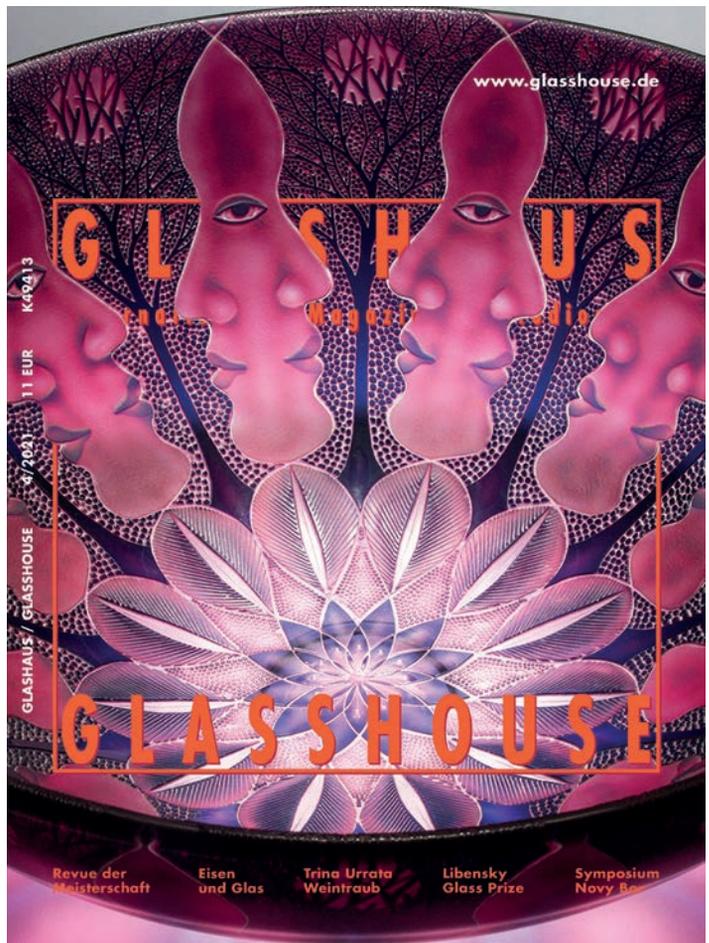
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