

# GLASS PATTERNS®

— Q U A R T E R L Y —

Summer 2021

Volume 37 • No. 2

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Volume 37 No. 2

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on designs by Justin Behnke*

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### Upcoming Submission Deadlines

<b>Winter 2021</b>	<b>Winter, Wildlife, and Landscapes</b>
Editorial	August 20, 2021
Ad Closing	October 20, 2021
Ad Materials	October 30, 2021

<b>Spring 2022</b>	<b>DIY, Home Decor, Lighting, Tiles, Tables, and Wall Art</b>
Editorial	November 1, 2021
Ad Closing	January 20, 2022
Ad Materials	January 30, 2022



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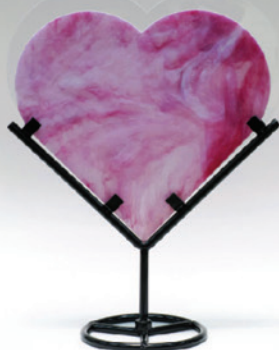
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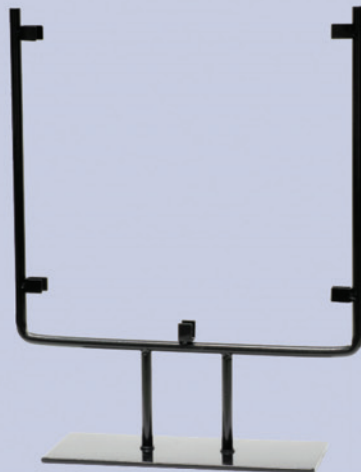
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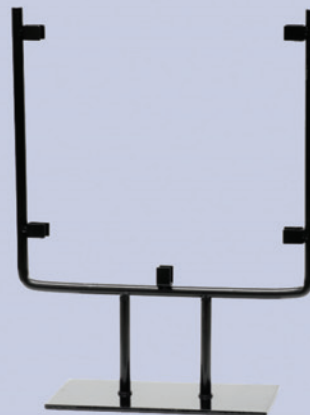
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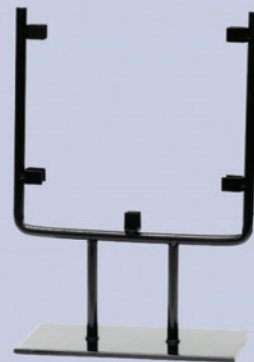
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# Upside-Down Hanging Planter

## An Introduction to Stained Glass

*Design, Fabrication, and Text by Lidia K. Anderson*



**I**love planters! Filling a space with live or even faux plants brings a fresh look to any space. The glass types and colors are up to you—clear glass, textured, cathedral, or even opalescent glass. There's no right or wrong way to decorate.

Inspiration for designing this upside-down planter came from seeing a planter made from a sea urchin. You can be creative with yours and design it with 4, 5, or 6 pieces of glass and follow the same directions given. With only 3 pieces of glass, this is a very simple beginner project that can be finished in 2 hours or less.

### Glass

Any Desired Type or Color

### Tools and Materials

Temperature Controlled Soldering Iron

60/40 Solder for Faux Plants

Lead-Free Solder for Real Plants

7/32" Copper Foil

1 or 2 pieces of 12" Brass Box Hinge (Outer Bar)

Flux Flux Brush

Size 7 Brass Fishing Swivel Hook

Permanent Marker Wire Cutter

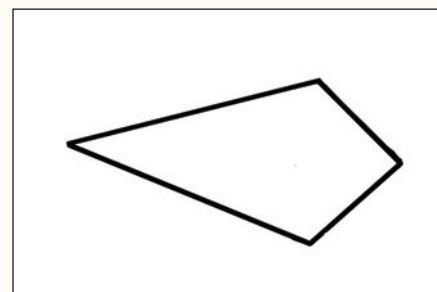
Regular or Locking Pliers

Ribbon, Chain, or Fishing Line

Waxing Compound

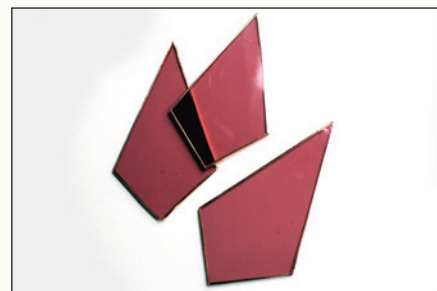
1

*Size the pattern to your preference, cut out the template, and trace it onto the glass.*



2

*Cut, grind, wash, dry, and foil all of the pieces.*

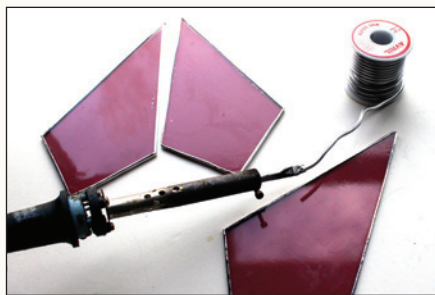


If you decide you would like to apply patina to the finished piece, be sure to choose a color of foil backing that matches the color of the patina. Tip: I like to wash my glass in rubbing alcohol after grinding to make the copper foil stick better.



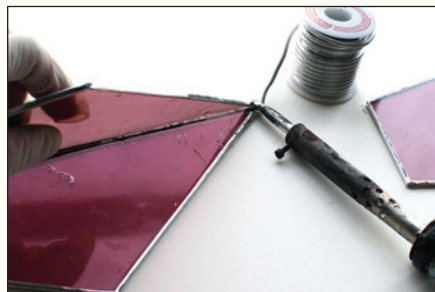
Flux and tin-solder all of the exposed foil on the front, back, and sides.

3



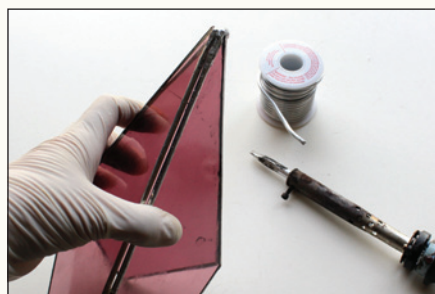
Arrange 2 pieces as shown and tack-solder the two points together from the underside to secure them to each other.

4



Add the third piece of glass as shown and repeat step 4 to form a solid pyramid.

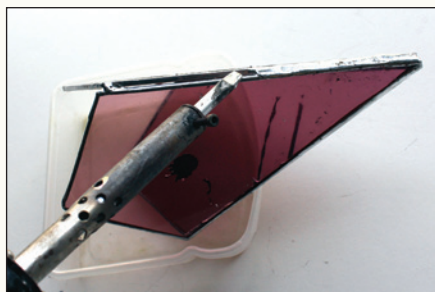
5



Be sure to line up the points accurately.

Turn the temperature down on the soldering iron slightly, apply flux, and bead-solder the inside seams.

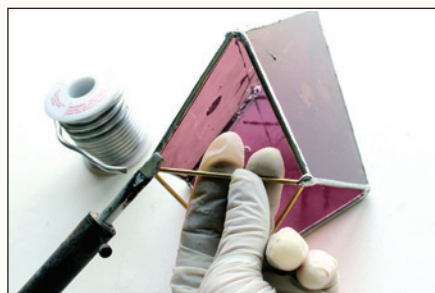
6



Turn the piece over and bead-solder the outside 3 seams to be smooth.

Measure and cut the correct length for the pieces of brass tube, then attach them to the opening.

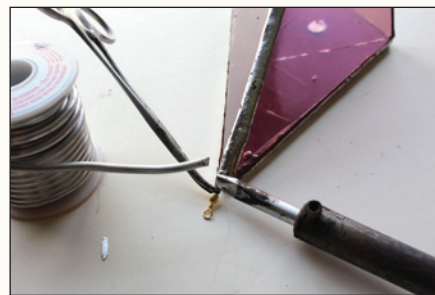
7



Measure the distance between the bottom points, mark the length on the brass tube, and use wire cutters to cut 3 pieces to that length. While holding the tube in the center of the 2 bottom points, tack-solder each point until it is secure. There will now be 3 triangular openings.

Holding onto the bottom of the brass swivel with a pair of pliers, flux and solder the swivel to the top center point of the pyramid.

8



You can use locking pliers if you have those.

Attach your desired length of ribbon, chain, or fishing line for hanging the planter.

9



You can now loop vines through the openings and also place air plants into the spaces to add interest to your finished planter.

GPO



Lidia K. Anderson of L.A. Glass is a native of Sydney, Australia, and it was there that she began her formal education in art. In her second year of college, she moved to the United States and received her BFA from Bowling Green State University in Ohio.

Lidia spent the next ten years as art director in the field of television. Recognizing the stresses of the advertising world, she took the opportunity to find other forms of artistic expression. Her love of glass was born, and she allowed this creative energy to guide her. What evolved were works of art that integrated into a more common understanding of functional living.

The larger body of Lidia's work is represented by some of the finest art galleries in the nation. She has had the privilege of exhibiting with the world-renowned artist, Dale Chihuly, and has also completed a restoration of eighteen stained glass windows at a chapel in Ohio. To view more of her work, visit [www.etsy.com/shop/LAGlass](http://www.etsy.com/shop/LAGlass).



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# Cyclamen

*Design, Fabrication, and Text by Chantal Paré*



“ . . . A cyclamen  
that looks like a flight  
of butterflies, frozen for a  
single, exquisite moment  
in the white heart  
of Time” . . .

Beverley Nichols

When I first laid eyes on Youghioghenny's cotton ball glass, I found it to be so whimsically delightful that I brought the entire sheet home with me. I certainly found a home for it framing this pastel, gently tinted panel where it doesn't overpower the light blue pencil frame and the delicate pink stipple flowers. This 20-3/4" x 12" design could easily be adapted for lead came by enlarging it by 150 percent and using 1-1/2" bevels instead of 1" bevels.



### Youghiogheny Opalescent Glass

1000 HS L Soft White Opal Cotton Ball  
for Outer Edge, 1/2 Sq. Ft.  
1660 SP Ice White and Sea Blue  
for Inner Edge, 1-1/2 Sq. Ft.  
1007 SP Ice White With Pink Stipple  
for Flowers, Scrap

Various Green Mixes for Leaves, Scrap

### Wissmach Glass Co.

Clear Seedy Top Row Background, 1 Sq. Ft.

### Additional Glass

3 mm Clear Float Glass for Background, 2 Sq. Ft.

3" x 1" Bevels for Accents

### Tools and Materials

Fine Black Marker Light Box

Grozing/Breaking Pliers Electric Grinder

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

60/40 Solder Soldering Flux

Flux Brush 1/2" Zinc U-Came Miter Saw

Window Cleaner Black Lead Patina

Acetone Nail Polish Remover

Flux and Patina Neutralizer

14-Gauge Pretinned Copper Wire Masking Tape

Flux/Patina Remover

Number the pieces on the paper pattern and trace them onto the glass over a light box.

1



Use a ruler when tracing the straight lines.

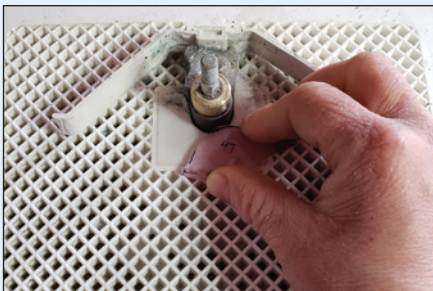
Score the glass pieces inside the traced lines and break them apart by hand or with grozing/breaking pliers.

2



Smooth all of the glass edges to fit the pattern with an electric grinder.

3



Aim for smooth curves or straight lines as required by the design.

Wrap all of the edges of the cut glass pieces and glass bevels with black-backed copper foil.

4



Carefully crimp the edges of the foil over the sides of the cut glass pieces and glass bevels with small craft scissors or a fid. Use 3/16" or 7/32" foil based on the thickness of each piece of glass.

Make a jig using a carpenter's square for right angles, then carefully place the pattern and the pieces inside the jig.

5



Solder the panel.

6



First, tack-solder the pieces on one side only. Gently flux the glass and drop a bit of solder around each piece, just enough to hold it in place. Be sure that each piece is precisely centered within the boundaries of its place on the pattern before and after you tack it.

Next, one small area at a time, completely flux and solder the pieces together taking care to make a nice bead over each line. Turn the panel over and fully solder the other side. Leave some space around the edges of the project free of solder so you will be able to slip on the zinc frame later.

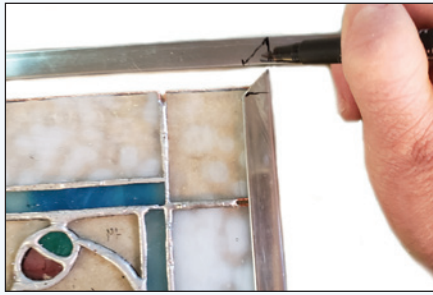
Cut out small pieces of copper foil overlay to form the flower stamens, then flux and solder.

7



8

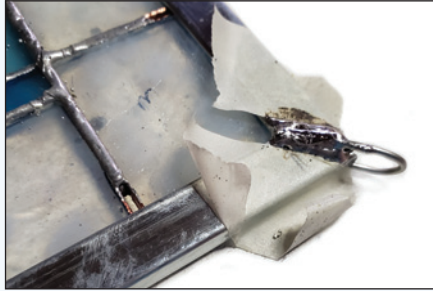
Frame  
the panel.



Taking careful measurements, cut the zinc came with a manual or electric miter saw to create a frame around the panel.

9

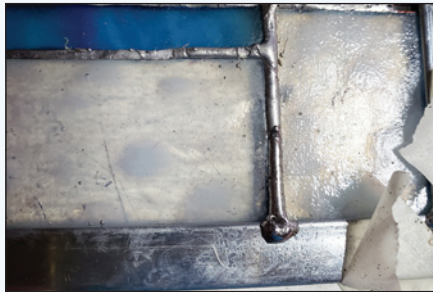
Solder the  
corners of the  
panel and add  
the hanging  
hooks.



Solder the corners of the panel using masking tape as resist. Slip in some bent 14-gauge pretinned copper wire in the upper corners to form hooks for hanging.

10

Solder the  
remaining lead  
lines to the frame  
on both sides.



11

Remove any  
trace of marker  
on the glass using  
a generous amount  
of acetone nail  
polish remover.



12

Use masking  
tape to protect  
the zinc frame  
before adding  
the patina.



13

Apply the  
black patina  
to the solder  
lines.



Pour a tablespoon at a time of the black patina directly on the project over small areas and spread it with a gloved hand. Pat the excess patina solution with a paper towel to remove any excess patina.

14

Spray with  
flux and patina  
neutralizer, wash  
off the panel with  
abundant water,  
and clean with  
window cleaner.



Your panel is now ready to hang so you can enjoy its delicate beauty all year long.

GPO



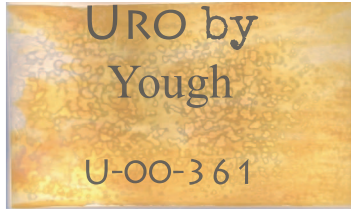
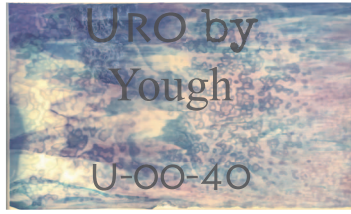
Two decades ago, Chantal Paré quit the fast-paced world of molecular biology to devote herself to the full-time pursuit of glass. She's liable to melt it, blow it, break it, paint it, or cast it, sometimes just to show it who's boss. Nothing else comes close to creating an object through which light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



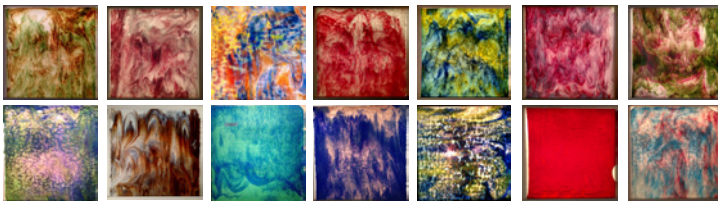
Lately, Chantal is concentrating her efforts in glass painting. In her free time, she also draws and self-publishes patterns in a variety of styles ranging from Victorian to geometric that are available at [www.free-stainedglasspatterns.com](http://www.free-stainedglasspatterns.com).



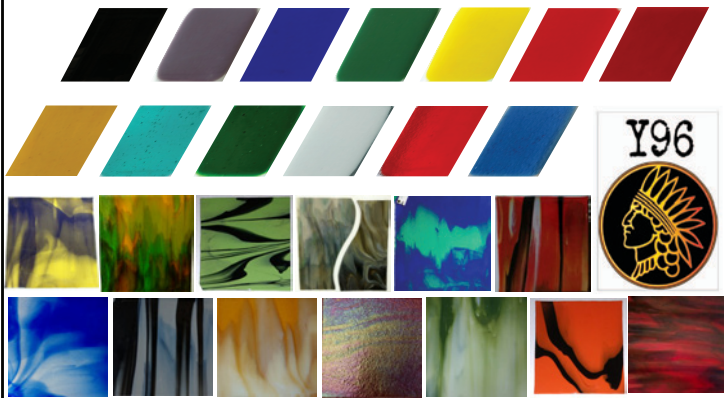




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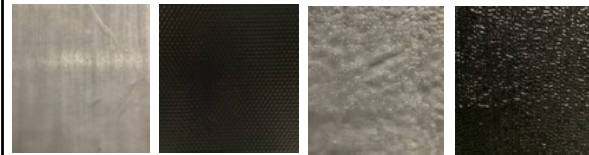


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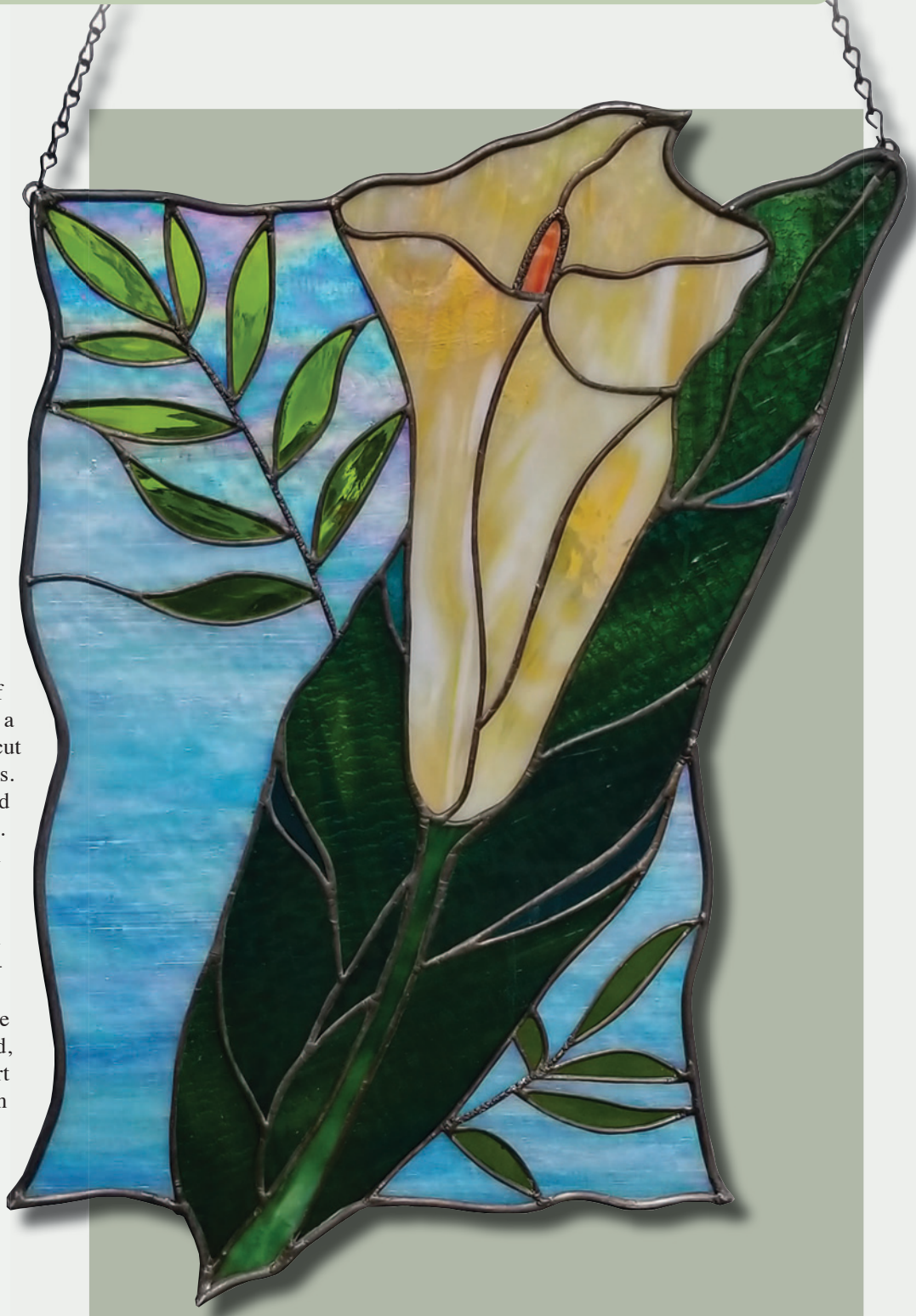
# Grateful Expressing Appreciation for Friends and Family

*Design and Text by Dionē Roberts, Fabrication by Akalia Woods*

When we think about how grateful we are for our families and friends, we like to find ways to show them how important they are to us. Making this 14-1/2" x 20" free-form floral panel can be a great way to accomplish that, since yellow calla lilies are said to symbolize gratitude.

To begin, make two copies of the pattern. One will be used as a layout copy, and the other will be cut apart to become the pattern pieces. Now number the pattern and add appropriate glass grain markings. Make sure that the background grain runs across the panel horizontally and the pattern pieces for the flowers and leaves have grain markings that mimic the way flowers and leaves grow.

Use spray glue to adhere one copy of the pattern to the tagboard, then cut the pattern pieces apart with your three-bladed pattern shears. Put the second pattern on your work surface to use for building your panel.





## Glass

Opal Marigold for Calla Lily, 1 Sq. Ft.

Orange Opal for Flower Stamen, Scrap

Iridized Aqua for Background, 1-1/2 Sq. Ft.

Green/Turquoise Opal for Stem and Large Leaves, 1-1/2 Sq. Ft.

Aqua for Large Leaf Accents, 1/2 Sq. Ft.

Bright Green Cathedral for Small Leaves, 1/2 Sq. Ft.

## Tools and Materials

Foil Pattern Shears Glass Cutter

Running/Grozing Pliers Spray Glue Tagboard

7/32" Copper Foil 60/40 Solder

KWC Table Foiler™ (optional) Horseshoe Nails or Pushpins

Flux and Flux Brush Cotton Balls or Small Brush

14-Gauge Copper Wire Basic Soldering Supplies

Lead Stretcher Lead Nippers Black Patina

5/32" Round Lead C-Came Glass Cleaner

Glass Wax Hanging Chain

Trace the pattern pieces onto the glass, then cut them out using your choice of glass cutter and running/grozing pliers.

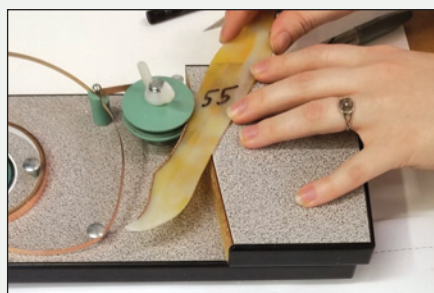
1



Grind the pieces as needed and place them on the layout copy of the pattern on your workbench.

2

Foil the glass.



Foil each piece by hand or use a foiling machine. I prefer the KWC Table Foiler. If you're using black patina, use black-backed foil. Black patinated pieces make the colors pop!

A good rule of thumb is to always match the backing of the copper foil tape to the finish you intend to put on your piece. If leaving it silver, use silver-backed foil. If using copper patina, use copper foil that is copper on both sides.

3

Use horseshoe nails or pushpins to hold the pieces in place and make sure they don't shift as you tack-solder.



4

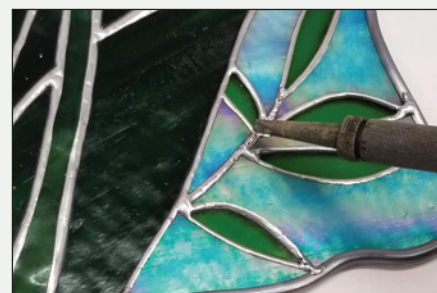
Flux and tack-solder the glass pieces.



Using a flux brush, flux the copper foil lines on one side of the panel, then use 60/40 solder to tack-solder all of the pieces in place. Tin all of the lines and finish with a nice rounded bead, keeping all of the soldering 1/4" to 1/2" from the edge of the panel. Flip the panel and solder the back side side by fluxing, tinning, and beading as you did on the front, then flip the panel back to the front.

5

Add decorative solder to some of the lines if desired.



As an optional step, I like to add decorative soldering techniques to some of the solder lines. If you desire, flux the stems of the small green leaves. Now holding the soldering iron with the tip in a vertical position, use the pointed edge to "tap" along the seam line with the iron tip. Go slowly enough to make small melted dimples, but not so slowly that it melts the entire seam line. Carefully run your finger over the decorative soldered seam line. If it is sharp, reflux and "tap" again.

6

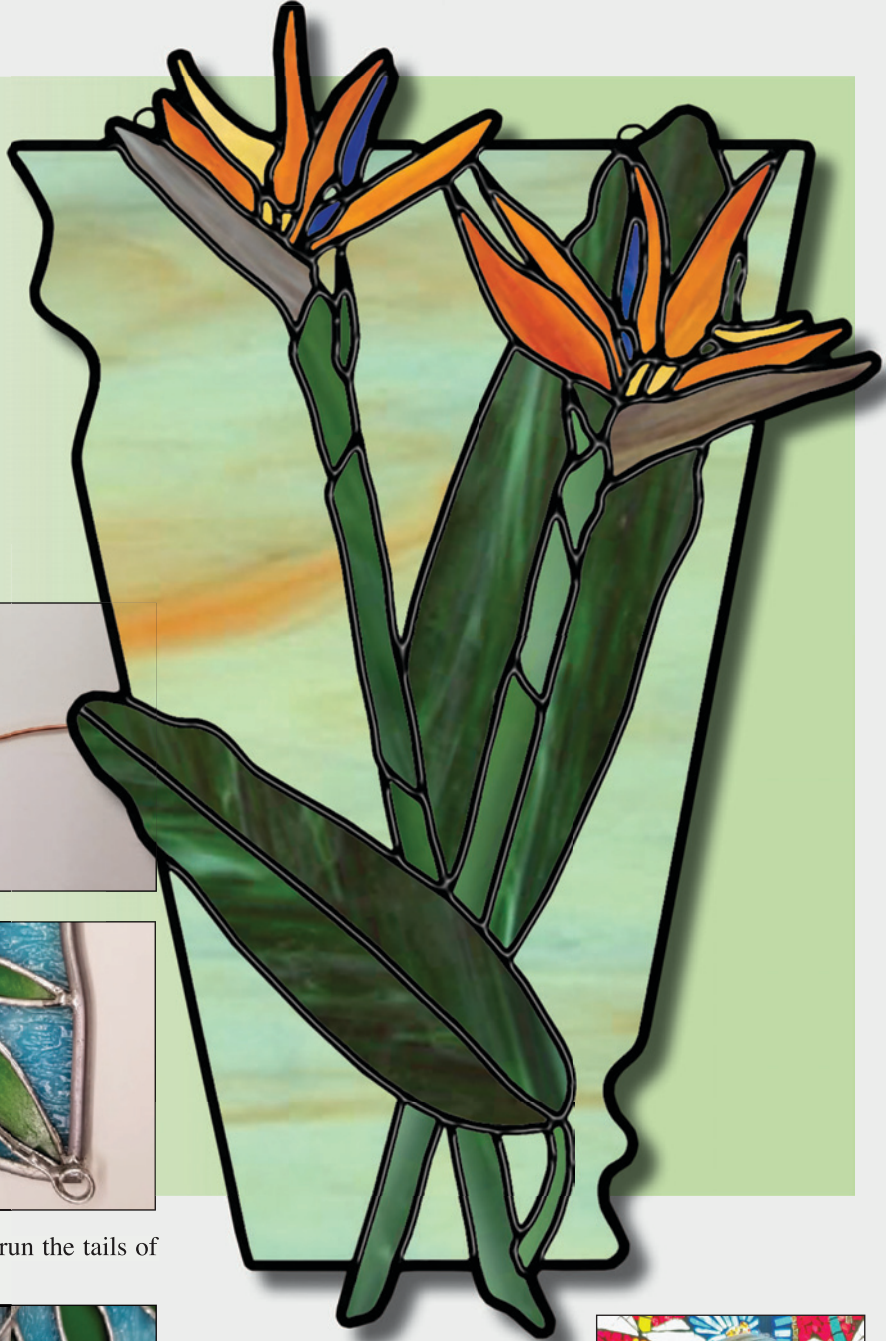
Mold the C-came around the outer edge of the panel.



Stretch a piece of 5/32" round lead C-came by securing it in a lead vice, then gently pulling the other end to stretch it slightly and straighten it. Do not overstretch. Trim the edges of the soldered stained glass panel with the lead came, cutting the pieces with a lead nipper and soldering it to all of the solder lines that intersect the outer edge.

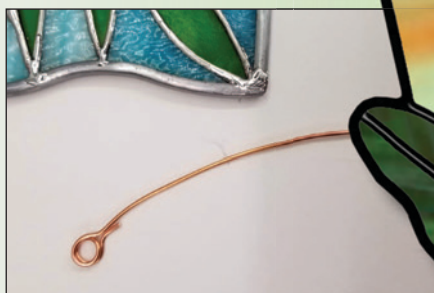
The lead is soft and can be molded around the organic edges of the panel. Cut the lead on the corners and the bottom part of the leaf to make nice sharp corners. Solder together, then flip the panel and solder where the solder lines intersect the edge. If any foil is visible from beneath the outer edge of the lead, trim it with a hobby knife.

Bird of Paradise by Dionē Roberts  
from the Spring 2020 issue of  
Glass Patterns Quarterly®.



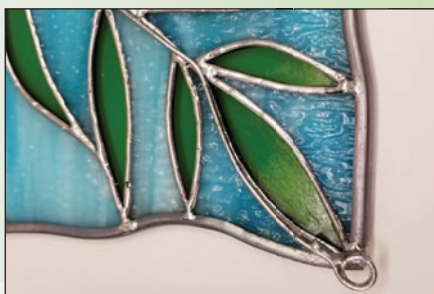
7

Wrap the 14-gauge wire around a pen or flux brush to make a double loop and leave a 4" tail on the end.



8

Solder the round hook into the top lead edge of the panel, then run the tail into the panel and tack every few inches.



See the dotted line on the pattern for where to run the tails of the wire.

9

Finish soldering the hook, then clean and polish the panel to finish.



Build up solder around the wire and along the entire length of the tail to make it blend into the solder seam. Now clean the finished panel well with a flux remover and dry the piece. Working on one side at a time, use a cotton ball or small brush to apply the black patina to the solder lines and the round lead C-came.

Work quickly to blacken the solder, then use a glass cleaner to clean it off. Do not let the patina sit on the glass, since patina can stain glass.

After both sides are finished, use a good quality glass wax to polish the panel, front and back. Use your favorite decorative chain to hang the calla lily panel, then take time to think of all you are grateful for!

GPQ

Dionē Roberts caught the glass bug early in life. She worked with glass making mosaics, original designed stained glass panels, and fused glass in her spare time. In 1994 the artist made glass her full-time work when she opened D&J's Glassworks in Billings, Montana.

During her glass career, Dionē has had 12 pattern books of glass designs published and continues to design for glass stores around the country. Currently, her passion is painting on glass with kiln fired enamels. She sells her work in local galleries.



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# Orchid Panel

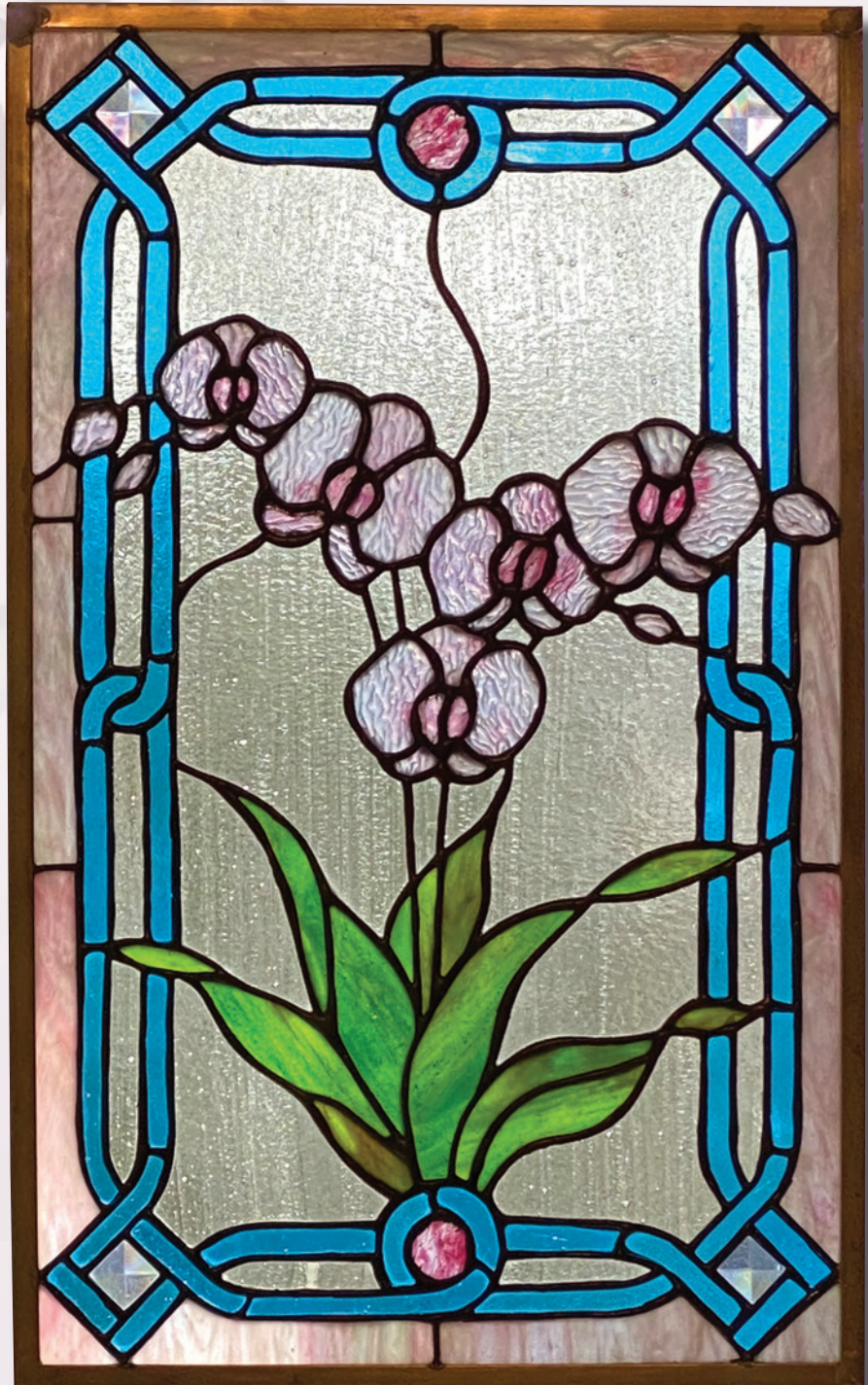
*Design by Justin Behnke, Fabrication and Text by Carrie Deutsch*

Photographs by Carrie Deutsch and Mike Deutsch

My Momma loved orchids, and for many years she grew them at her North Carolina home in many varieties and colors. In 2017 when my momma passed away suddenly, I asked Justin if he could make me a pattern for an orchid. He sent me this pattern as a memorial to Momma.

I started this 11" x 18" project many times but kept setting it aside, because my emotions would get the better of me. During a cleanup of my work area, though, I came across the pattern and felt like maybe this time I could complete the piece. It has been a trial as well as a triumph working on this panel.

Finding the right glass is one of my favorite parts of creating stained glass pieces, and this time it turned out to be my biggest challenge in my efforts for it to be a perfect memorial piece. When remembering the many orchids that my Momma grew, I could visualize her very favorite orchid. It was pink and white and had what I called "fluttery" petals. Searching through my stash of "special" glass, I found the perfect piece for the flowers.





**Wissmach Glass Co.**  
115DR Medium Copper Blue Double Rolled  
for Thin Border, Scrap

**Youghiogeny Opalescent Glass**  
4554 SP Green for Leaves, 3/4 Sq. Ft.

**Additional Glass**  
Pink on White Ripple for Orchids  
and Round Border Accents, Scrap  
Clear Opalescent Light Green/Pink Streaky  
for Outer Border, 1-1/2 Sq. Ft.  
Light Amber for Background, 1-1/4 Sq. Ft.

#### **Tools and Materials**

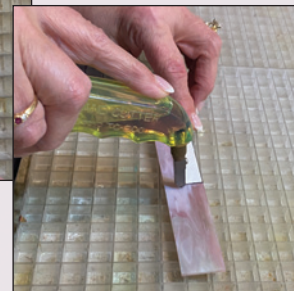
Foil Pattern Sheers  
Creator's® Cutters Mate Glass Cutter  
Grozing and Running Pliers Grinder  
Morton Layout Block System Pushpins  
Paper Towels X-Acto® Knife  
7/32" and 3/16" Black-Backed Copper Foil  
Foil Burnisher/Fid Classic 100 Gel Flux  
60/40 Solder Hakko® FX-601 Soldering Iron  
Kwik-Clean® Flux Cleaner Nitrile Gloves  
Novacan Black Patina Cotton Swabs  
3/8" Brass U-Came Plastic Scrubbie  
Mothers® Carnuba Wax Clarity Polish  
Soft Rags 16-Gauge Wire

I originally wanted to use glass bevels for the top and bottom thin border accents, but I couldn't find any I liked that would fit. Instead, I used the Pink on White Ripple glass that I used for the orchids but put it textured side out for the accents.



3

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



4

*Use breaking/grozing pliers to break off any excess glass.*



5

*Grind each cut glass piece to smooth the edges.*



If I have done a good job cutting, then there really is not a lot to grind.

6

*Fit each piece to the pattern.*

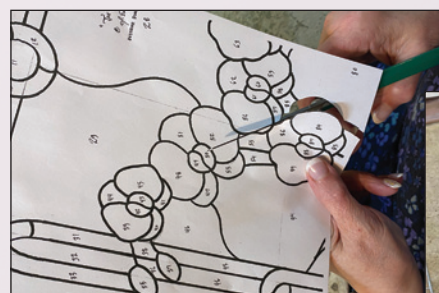


1

*Begin by spreading the pattern out and numbering the pieces.*



Be sure to show how the direction of the grain should go and put a symbol on the pattern for the color.



2

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



All artists have their own way of doing this, but I was taught many years ago to cut out the pattern pieces and glue them to the glass. I use pattern sheers to avoid having the pattern grow after the glass pieces have been foiled.





7

*Apply the foil to the glass pieces.*

Make sure all of the pieces are clean. I use a variety of sizes of foil— $7/32$ ",  $3/16$ ", or  $5/32$ "—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 more foil over the split and trim off the excess.



8

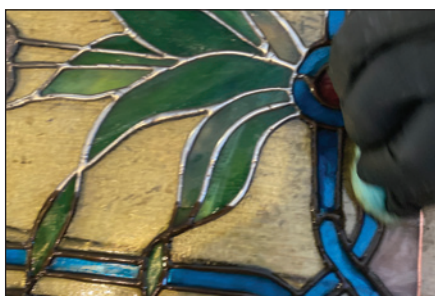
*Solder all of the foil lines.*

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

Before beginning to apply the solder, flux the foil. Next, tack-solder at the joints, then begin running a nice, rounded bead. Clean off all of the flux residue using Kwik Clean, then flip the piece over and solder the back side.

9

*Apply black patina to the panel.*



Once you have cleaned the panel to remove any residue of flux, you can apply the patina. Put a little in a plastic cup and use a toothbrush to apply it to the solder lines. Once you've covered all of the lines, wipe off any excess patina with a paper towel, then use a squirt bottle of water to spray down both sides of the panel and pat dry. Do the same to the back side.

10

*Apply wax to the panel and buff it up with a soft cloth.*



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

11

*Frame the panel.*



Choose the framing material you would like to use. I used  $3/8$ " brass U-came for this piece. My husband is the pro at this, so I gave him the panel and he used a cut-off saw to cut the came.

Once the U-came has been applied to the outside edges of the panel and taped on, solder the four main corners and use wire in the top corners to make a loop to attach chain to the corners for hanging. This is easily done by laying wire along the joint line before soldering the corners. I also take the time to attach the panel to the frame wherever there is a solder line that extends to the frame.

Once the frame is finished, clean up the panel again and touch up the patina if needed. I use Clarity Polish to give the panel the final polishing. Make sure to polish the frame as well. **GPQ**



*Carrie Deutsch has always had a passion for color and has been a crafter all her life. After her father died in 1986, she looked for something she could immerse herself in to take her mind off of her loss. In this search, she stumbled into a stained glass shop in Cary, North Carolina, and fell into the proverbial rabbit hole of stained glass. She took a class and never looked back.*

*Carrie has been creating stained glass items for close to 30 years. She has often said that the world goes away when she is creating a glass item. Her focus is entirely on the glass, textures, colors, and how they all blend together.*

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# Forest Floor

*Design by Justin Behnke, Fabrication and Text by Alecia Richardson*



This amazing pattern by Justin Behnke depicts the forest floor, also called detritus. It mainly consists of shed vegetative parts, such as leaves, branches, bark, and stems that exist in various stages of decomposition above the soil surface. Although principally composed of nonliving organic material, the forest floor also teems with a wide variety of fauna and flora, fungi, algae, bacteria, and archaea.

In this 18" circular panel, I have incorporated Tiffany foil stained glass techniques and framed it in a circular wood frame.

Justin has a distinct way of always capturing every aspect of details in his designs. To see more of his amazing patterns, visit his store at [www.etsy.com/shop/JustinBehnkeStudio](http://www.etsy.com/shop/JustinBehnkeStudio).



### Youghiogeny Opalescent Glass Co.

605OC White/Dark Red Oceana for Mushrooms, 1/8 Sq. Ft.

1002HS Honey High Strike for Morel, Scrap

#### Additional Glass

Pale Green/White for Pulpit Flower, Scrap

Pale Amber for Skull, 1/4 Sq. Ft.

Dark Leaf Green for Tree, 1/4 Sq. Ft.

Medium Amber for Tree Trunk, 1/8 Sq. Ft.

Sky Blue for Sky, 1/4 Sq. Ft.

Irid Green for Trillium, Scrap

Solar Bronze for Border, 1/2 Sq. Ft.

Green/Dark Amber Opal for Ground, 1/4 Sq. Ft.

Purple for Flowers, Scrap

Green for Small Leaves, Scrap

#### Tools and Materials

Scissors Sticker paper Grinder

Toyo Pistol Grip Cutter Running Pliers

Fine-Point Sharpie Marker® Pushpins

Rubbing Alcohol X-Acto® Knife

7/32" Black Backed Copper Foil

Hobby Came Nokorode® Paste Flux

60/40 Solder Hakko® Fx-601 Soldering Iron

Kwik-Clean Flux Cleaner Steel Wool

Novacan Black Patina Cotton Swabs/Rounds

.025 mm Sticky Backed Copper Sheet Foil

Fine Steel Wool 18" Wood Quilt Circle

1



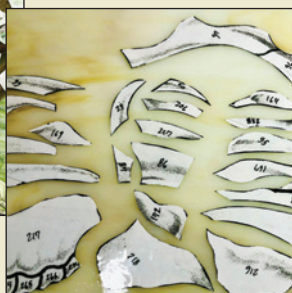
To begin,  
make two copies  
of the pattern.

One copy will be on regular paper to use for laying out the glass pieces. The second one will be on a full sheet of sticker paper to adhere the pattern to the glass. Coloring in the pattern is optional. Selecting part of the design to use with foil overlay is also optional. Directions for doing that can be found in steps 7 through 13.



Cut out the pattern pieces from  
the sticker paper and stick them  
to the glass.

2



Remove all of the black lines to ensure proper fit. I prefer sticker paper, since it tends to stay better than glued on paper. It also helps to ensure a more accurate cut.

3

Score the  
glass pieces  
as closely to  
the sticker paper  
pattern pieces  
as possible.



4

Use  
breaking  
pliers to  
separate the  
individual  
pieces.



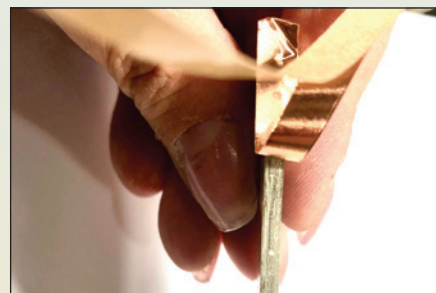
5

Grind all  
of the pieces  
as closely as  
possible to get  
the best fit.



6

Apply the  
foil to the  
glass pieces.



Remove the stickers from the glass, clean all of the edges with alcohol, and assemble the clean pieces on the layout copy. Apply foil to all of the glass pieces, trying to get the foil on as evenly as possible, then burnish all sides of the foil.

7

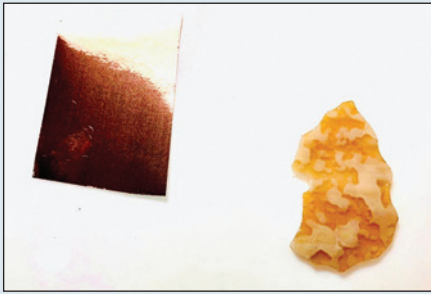
Choose the  
parts of the  
design you would  
like to overlay  
with the copper  
sheet foil.





I chose a morel, pattern pieces number 150, 151, 232, 233, and 234. Keep this part of the pattern whole instead of cutting it into separate parts and prepare the glass following steps 2 through 5 before going to step 8.

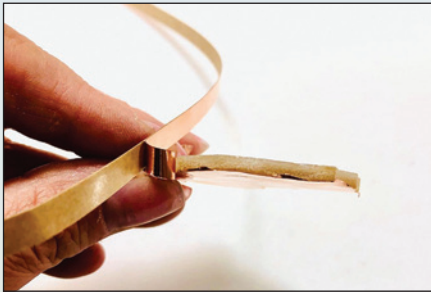
8  
Cut a piece of the adhesive-backed 0.25 mm copper sheet foil to fit the morel.



9  
Adhere the foil to the front of the glass and remove any excess with the X-Acto knife.



10  
Foil the glass piece as you normally would.



11  
Draw on the design that you want to cut out with a fine-point Sharpie.



12  
Remove any excess foil with an X-Acto knife.



13

Pin all of the glass pieces in place on the pattern.



14

Flux and solder the glass pieces.



15

Clean the glass thoroughly with Kwik-Clean, then buff all of the solder lines with fine steel wool and clean again.



16

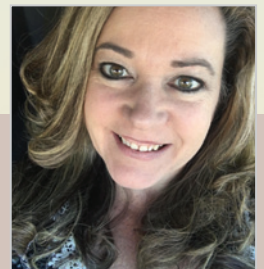
Apply black patina with a toothbrush, or use a cotton swab for small areas.



Finally, give the finished panel a good polish and enjoy your beautiful new design.

GPO

Alecia Richardson has always loved art from a very early age. She grew up drawing, painting, and trying many different crafts before she found her muse in stained glass in 2016. A self-taught stained glass artist, Alecia draws all of her own patterns and uses "out of the box" glass techniques, specializing in copper foil overlays and hand painting on glass. To learn more about her art, please visit [www.linktr.ee/AleciaExpressions](http://www.linktr.ee/AleciaExpressions).







Discover the intriguing world of murrine miniatures through the eyes of glass pioneer Loren Stump and boro artist Stephen Boehme. You'll also find thought-provoking hot glass work by Alexander Rosenberg and unique warm glass scenes by Kate Baker. A look at how one piece of artwork can lead to the next plus the latest industry news round out this all-star issue.

*On the cover May/June 2021 issue of Glass Art® Loren Stump, detail of Nativity Triptych. Photo by Rich Images.*

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# Luna Moth with Poppies

*Design by Justin Behnke, Fabrication and Text by Cindy Dow Savary*

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



Luna moths are not rare, but they are rarely seen. It is hard to imagine that as an adult they only live seven to ten days. During that time, their whole purpose is to attract mates and reproduce. The intricate eye patterns on their back wings are used to protect themselves from predators. Having what looks like “eyes” two or

three inches apart puts them in a size category that many predators would avoid. In addition, their elongated tails are thought to confuse the echolocation detection used by bats when the moths spin them in a circular motion. Though they look luminescent, it is only because of their reflective scales.



This 18-1/2" circular pattern was designed by Justin Behnke, who continuously creates new patterns based on customer needs. When you are working on one of his patterns, always look at his shading. If you look closely, there are clues for changing up or adding to the pattern if you are so inclined.

When I pick out glass colors for my stained glass work, I first consider what the subject matter looks like in nature, then take my time picking out the glass to make sure they all work together. I always color my patterns first with colored pencils. This helps me when picking out glass colors, because it gives me a visual place to start. You'll need to make two copies of the pattern—one to use for cutting out the glass and the other for assembling the glass pieces.

With circular patterns, it can be difficult to keep the glass pieces tight, so I use pushpins hammered into the Homasote board. Keeping the outer ring tight ensures that everything will stay in place for a better overall fit.



#### Wissmach Glass Co.

9615 LUM Cornflower Blue Iridized  
for Background and Outer Circle, 1-1/4 Sq. Ft.  
EM4921 Light Copper Red English Muffle  
for Poppies, 2/3 Sq. Ft.

#### Additional Glass

Spring Green Opalescent Thin Roll  
for Moth, 1/2 Sq. Ft.

Cranberry Pink/Emerald Green/White Double Roll  
for Thin Circle and Moth, 1/3 Sq. Ft.

Neo Lavender Thin Roll  
for Inner Circle, 3/4 Sq. Ft.

Green for Flower Stems, Scrap  
Brown for Flower Centers, Scrap  
Black for Flower Centers, Scrap  
Off-White for Luna Moth, Scrap  
22 mm Green Gems (7)

20 mm White Opalescent Gems (2)

#### Tools and Materials

Foil Pattern Scissors Toyo Pistol Grip Cutter

Grozing and Running Pliers Grinder

Permanent Markers Homasote® Board

Pushpins X-Acto® Knife Paper Towels

Rubbing Alcohol 60/40 Solder

7/32" and 1/4" Black-Backed Copper Foil

Aanraku Foil Burnish Roller Safety Glasses

Lathekin/Plastic Fid Nitrile Gloves

Hakko® FX-601 Soldering Iron

Horseshoe Nails Hammer

1/2" Lead U-Came Kwik-Clean Flux Cleaner

Novacan Black Patina Scotch-Brite™ Pad

JAX® Pewter Black Liva Stained Glass Polish

Nokorode® Paste Flux Cotton Rounds/Swabs

Purple Marabu Transparent Relief Paste

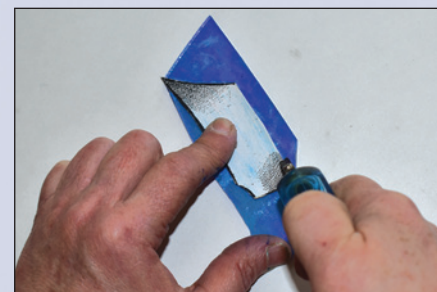
Purple and Gold Marabu Relief Paste

1



*Glue the  
pattern pieces  
to the glass.*

2



*Score as  
close to the  
pattern as  
possible.*

3



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

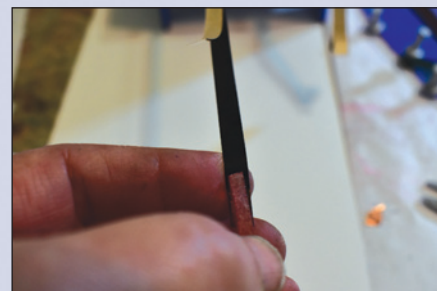
4



*Use a  
grinder to  
smooth out  
any rough  
edges.*

For some pieces, I like to use a cookie grinder.

5



*Apply foil  
to all of the  
glass pieces and  
the glass gems.*

Begin by cleaning each piece with rubbing alcohol and drying the glass. I use 7/32" foil on glass pieces with regular thickness and 1/4" foil on thicker pieces. Put the glass to the foil, making sure it is centered, then wrap the entire piece. Use your fingers to smooth the foil on each side and burnish the foil with a fid or foil roller until it is smooth on both sides of the glass and on the edge.



6

*Place the foiled pieces of glass on the layout copy.*



I use pushpins to keep the outer pieces in place. This is an important step to keep the outer ring secure so that all the pieces fit properly.

7

*Apply flux to the copper foil lines.*



Note that too much flux can cause the solder to splatter and create bubbles in your solder seam.

8

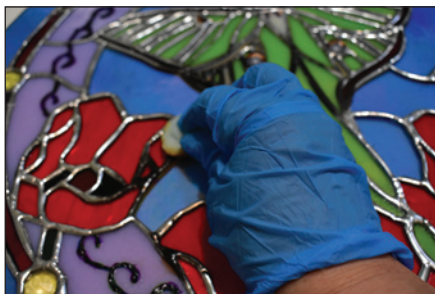
*Tack-solder each joint before running a smooth raised bead of solder on the front and back of the panel.*



Thoroughly clean the panel using Kwik-Clean Flux Remover to remove any residual flux.

9

*Apply Novocan black patina.*



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

10

*Frame the panel using 1/4" to 1/2" lead U-came.*



The U-came will need to be stretched. Your local glass store will be able to do this for you, or you can also use a vise. I like to keep the U-came mounted on a flat plank board, because that makes it easier to manage without it twisting every which way.

Be sure to start at the bottom of the panel at one of the joints where the solder lines meet. Use horseshoe nails to secure the U-came to the panel. Gently tap the U-came with the hard end of the hammer until the glass is secure in the channel.

11

*Use a lead nipper to cut the U-came where the ends meet.*



Apply flux where the soldered lines meet the U-came and solder. Be careful not to hold the soldering iron in place for too long, because that will cause the U-came to melt. I turn the temperature on my Hakko down from 410°F to 360°F.

12

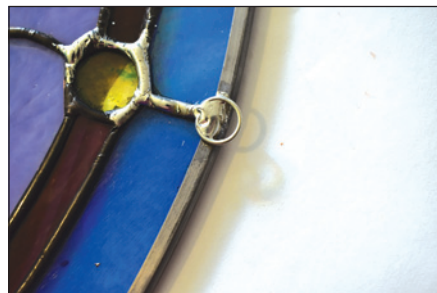
*Scuff up the U-came with a Scotch-Brite pad, then add the JAX Pewter Black to the U-came.*



Clean the panel with Kwik-Clean.

13

*Add jump rings to the joints where the solder line meets the U-came for hanging the pattern.*



14

*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.



15

Add the final details to the design.



Use Purple and Gold Marabu Relief to create the eyes on the Luna Moth. Use Purple Marabu Transparent Relief Paste to create the circular lines on the Neo-Lavender glass, which is the middle ring. Marabu Relief Paste does not have to be baked and is nonfading. Now that your panel is complete, it's time to find the perfect place to hang it as a reminder of these beautiful, intriguing creatures.

GPO

Justin Behnke, a master glass craftsman and illustrator, is dedicated to producing beautiful projects and patterns for stained glass studios and hobbyists. He is also involved in stained glass installation and repair. All of Justin's patterns, which are created by hand by the artist, are available for purchase as prints or digital downloads and have enjoyed the support of hundreds of stained glass hobbyists and professionals. More about the artist can be found on his Facebook page, @Justin-BehnkeStainedGlass. His online catalog can be seen in his store at [www.etsy.com/shop/JustinBehnkeStudio](http://www.etsy.com/shop/JustinBehnkeStudio).



Cindy Dow Savary has always had a passion for art and has been a crafter all of 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 and enlarge a piece that would become part of a new Airbnb called Annabella's Studio. The client wanted to honor the memory of her friend, 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.savary.77](https://www.instagram.com/cindy.savary.77) or go to [www.facebook.com/APassionForGlassByCindySavary](https://www.facebook.com/APassionForGlassByCindySavary).

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# Pink Perfection

*Design and Text by Leslie Gibbs*

**C**alla Lilies are such serene and elegant flowers. Standing tall on their thick green stems, they attract hummingbirds and butterflies to your garden! If you don't have a garden, grow your own lilies in your studio. For this 8" x 14" design, I chose the pink variety, which is said to symbolize appreciation and romance, but this lovely flower also blooms in many colors including white, yellow, peach, purple, red, and even black.

Most commonly seen is the white variety, as in Georgia O'Keeffe's fabulous images on canvas, this beautiful flower is topped with a graceful trumpet-shaped blossom that instills tranquility in the viewer. Creating this pattern probably will not attract butterflies and hummingbirds to your studio, but the completed panel glowing in a sun drenched window could attract a smile and sense of joy.

**GPQ**



## **Wissmach Glass Co.**

7-D Gold Pink/Dense Opal/Crystal for Flowers, 1 Sq. Ft.

7-L Gold Pink/Light Opal/Crystal for Inside of Flowers, Scrap

1-D Silver Yellow/Dense Opal/Crystal for Flower Centers, Scrap

WO-152 Yellow Green/Opal Green/Crystal Wisspy for Stems Above Water, Scrap

264-LL Medium Purple/Yellow Green/Sky Blue/Opal/Crystal Streaky for Stems Below Water, Scrap

WO-264 Medium Purple/Yellow Green/Sky Blue/Opal/Crystal Wisspy for Vase Below Water Line, Scrap

163-L-IR Medium Purple/Medium Green/Light Opal/Crystal Iridescent for Border and Shadow, 2 Sq. Ft.

163-LL Medium Purple/Medium Green/Light Opal/Crystal Streaky for Border Highlights, Scrap

WO-325 Light Amber/Opal/Crystal Wisspy for Background and Vase Above Water Line, 2 Sq. ft.

## **Tools and Materials**

7/32" Copper Foil Flux Solder Black Patina 1/2" U-Channel Zinc





# DELPHI

STAINED GLASS FUSING MOSAICS JEWELRY FLAMEWORKING



*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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## Whale, HELLO THERE



Artist: Kelli Graves. From Delphi's Online Artist Gallery.

## ALL YOU NEED IS GLASS AND SOME VITAMIN SEA



Artist: Yulia Hanansen. From Delphi's Online Artist Gallery.

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# Sandpiper

Design by Paned Expressions Studios, Text by Darlene Welch



If you've ever been to the beach, chances are you've seen sandpipers, small birds that walk along the coastline when hunger calls to find tasty morsels living beneath the sand. This 18"-diameter stained glass design captures the scene perfectly.

A careful selection of glass colors and grains adds realism and depth to the piece. Besides the colors that are suggested here for the bird, there are a wide variety of sandpipers with different colors and markings, including those with white or spotted bellies. Also notice how combining lighter and darker areas of the steel blue glass for the water helps to give the appearance of the sun shining on the waves. For the sky and clouds, the same basic color is used for both, but the sky is done in a dense opal glass while the clouds are created with a light opal base.

*Sandpiper* is just one of over 130 patterns that can be found on the *Stained Glass Lite* pattern CD from

Paned Expressions Studios. These "designs on a diet" each have 100 pattern pieces or less and include traditional, entryway, and sidelight patterns, as well as nature, floral, fantasy, and occupational themes plus the signs of the zodiac. The patterns are provided on the CD in color as well as black and white in JPG, TIFF, and Glass Eye formats for both PC and Mac, which makes them easy to resize, reshape, and recolor. The designs also cover all levels of glass expertise, so there is something for everyone. Visit [www.panedexpressions.com](http://www.panedexpressions.com) for this and many other wonderful patterns from Paned Expressions Studios.

**GPO**

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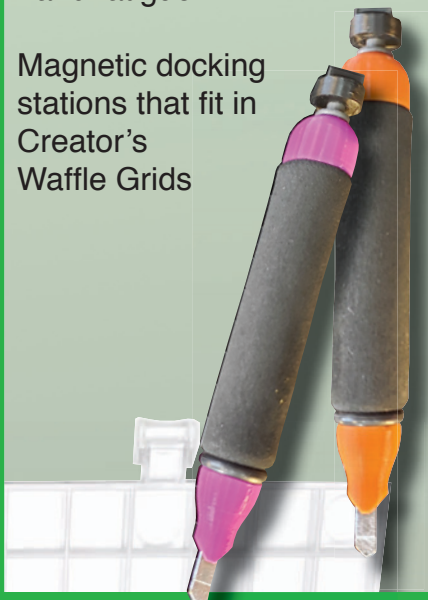
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# Lighthouse

*Design by Terra Parma, Text by Darlene Welch*

Since ancient times, the lighthouse has been a symbol of safe passage used to guide mariners into the harbor. This 13" x 20" pattern from Terra Parma is from the *Images Pattern Pack Set 1020* of the *Images by Terra* collection and is used with permission from Stained Glass Images.

More traditional colors are often chosen for the sky in stained glass panels, and Wissmach Glass Co. has a large selection of beautiful blues for that. An alternate color, 27-D Orange/Opal/Crystal, could also work well for the sky as long as a predominantly white portion of the glass is used.

When carefully matching glass colors and grain direction to the individual pattern pieces, you can create a sense of depth and realism by choosing glass colors in the same way that painters select paints. Notice, for example, that the darker blues used for the water in the foreground transition into lighter colors in the distance the way they would look in real life. Using darker portions of the gray glasses for the lighthouse and keeper's house on the left sides of the structures also provides a sense of perspective and matches the light source in the other areas of the design. Don't be afraid to experiment to make this project your own.

**GPO**



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## Lighthouse

Design by Terra Parma

### Wissmach Glass Company

- 238-D Dark Purple/Dark Blue/Dense Opal/Crystal for Sky, 3 Sq. Ft.  
272-D Dense Opal/Light Blue/Mauve for Clouds, 1 Sq. Ft.  
WO-188 Gray Blue/White Opal Wispy for Wave Whitecaps, Scrap  
437-L Dark Blue/Light Amber/Medium Purple/Light Opal/Crystal for Water Behind Wave, 1 Sq. Ft.  
119-L Cobalt Blue/Light Opal/Crystal for Water, 1/2 Sq. Ft.  
118-D Cobalt Blue/Dense Opal/Crystal for Distant Water, Scrap  
437-D Dark Blue/Light Amber/Medium Purple/Dense Opal/Crystal for Background, Scrap  
77-L Light Brown/Yellow Green/Light Opal for Beach, Scrap  
600-D Dense Opal/Light Gray for Lighthouse and Birds, 1 Sq. Ft.  
27-L.L. Orange/Opal/Crystal Streaky for Lighthouse Roof, Scrap  
613-L Williamsburg Blue/Light Opal/Crystal for Lighthouse Keeper's House, Scrap  
65-L Medium Brown/Blue/Light Opal for Lighthouse Keeper's House Roof, Scrap  
WO-502 Opal/Medium Gray/Brown Wispy for Stone Base of Lighthouse, Scrap  
78-L Medium Amber/Green/Light Opal/Crystal for Grass, 1/2 Sq. Ft.  
503-D Dense Opal/Dark Gray/Brown for Foreground Landscape, Scrap  
65-D Medium Brown/Blue/Dense Opal for Foreground Landscape, Scrap

### Tools and Materials

7/32" Copper Foil Flux Solder  
Black Patina 1/2" U-Channel Zinc

## Upside-Down Hanging Planter

### An Introduction to Stained Glass

Design by Lidia K. Anderson

Glass  
Any Desired Type or Color

## Pink Perfection

Design by Leslie Gibbs

### Wissmach Glass Co.

- 7-D Gold Pink/Dense Opal/Crystal for Flowers, 1 Sq. Ft.  
7-L Gold Pink/Light Opal/Crystal for Inside of Flowers, Scrap.  
1-D Silver Yellow/Dense Opal/Crystal for Flower Centers, Scrap.  
WO-152 Yellow Green/Opal Green/Crystal Wispy for Stems Above Water, Scrap.  
264-L.L. Medium Purple/Yellow Green/Sky Blue/Opal/Crystal Streaky for Stems Below Water, Scrap.  
WO-264 Medium Purple/Yellow Green/Sky Blue/Opal/Crystal Wispy Vase Below Water Line, Scrap  
163-L-IR Medium Purple/Medium Green/Light Opal/Crystal Iridescent for Border and Shadow, 2 Sq. Ft.  
163-L.L. Medium Purple/Medium Green/Light Opal/Crystal Streaky for Border Highlights, Scrap  
WO-325 Light Amber/Opal/Crystal Wispy for Background and Vase Above Water Line, 2 Sq. ft.

## Luna Moth with Poppies

Design by Justin Behnke

Enlarge to desired size

### Wissmach Glass Co.

- 9615 LUM Cornflower Blue Iridized for Background and Outer Circle, 1-1/4 Sq. Ft.  
EM4921 Light Copper Red English Muffin for Poppies, 2/3 Sq. Ft.

### Additional Glass

- Spring Green Opalescent Thin Roll for Moth, 1/2 Sq. Ft.  
Cranberry Pink/Emerald Green/White Double Roll for Thin Circle and Moth, 1/3 Sq. Ft.  
Neo Lavender Thin Roll for Inner Circle, 3/4 Sq. Ft.  
Green for Flower Stems, Scrap  
Brown for Flower Centers, Scrap  
Black for Flower Centers, Scrap  
Off-White for Luna Moth, Scrap  
22 mm Green Gems (7)  
20 mm White Opalescent Gems (2)

Enlarge to desired size

## Forest Floor

Design by Justin Behnke

### Youghiopheny Opalescent Glass Co.

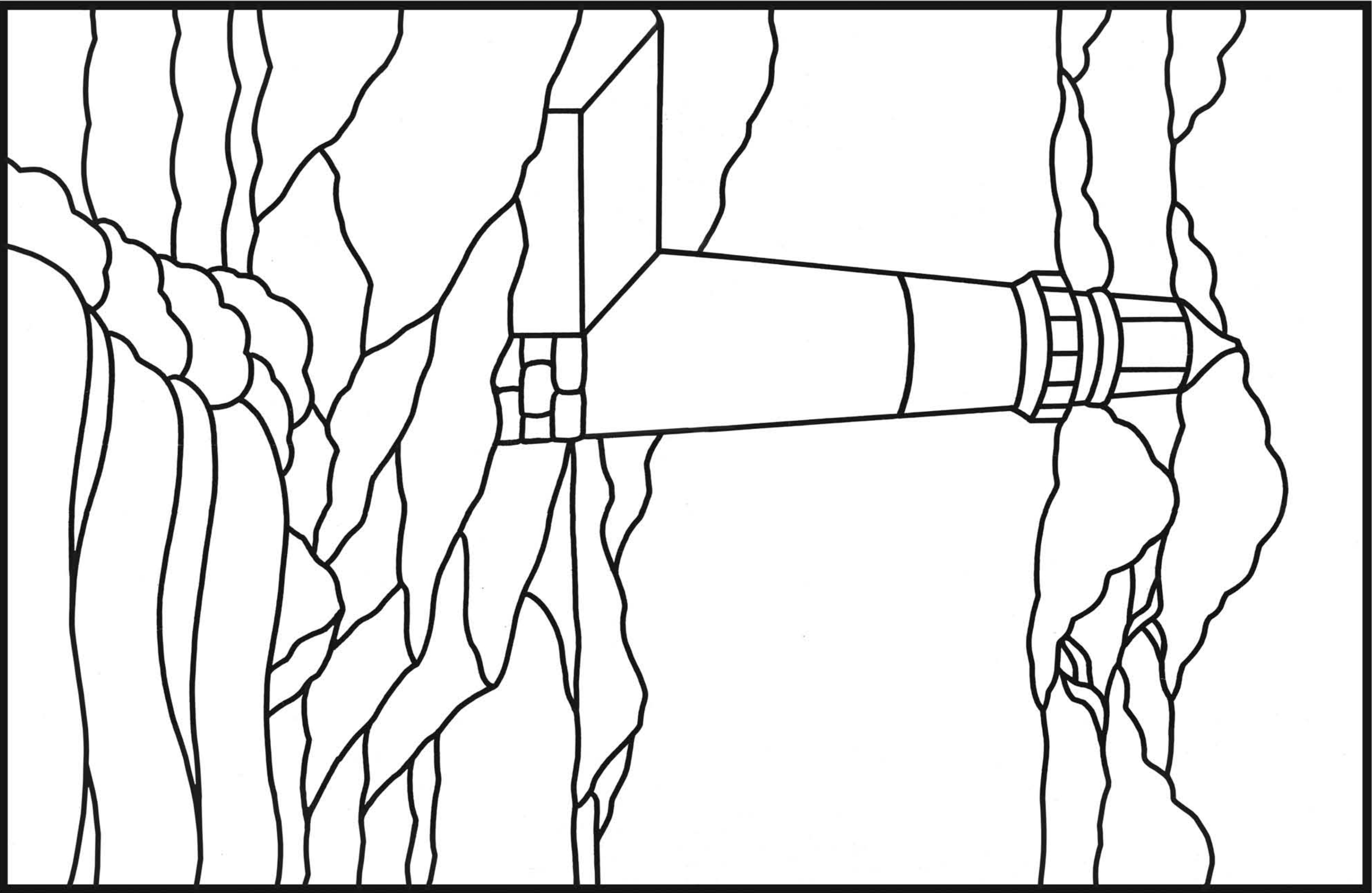
- 605OC White/Dark Red Oceana for Mushrooms, 1/8 Sq. Ft.  
1002HS Honey High Strike for Morel, Scrap

### Additional Glass

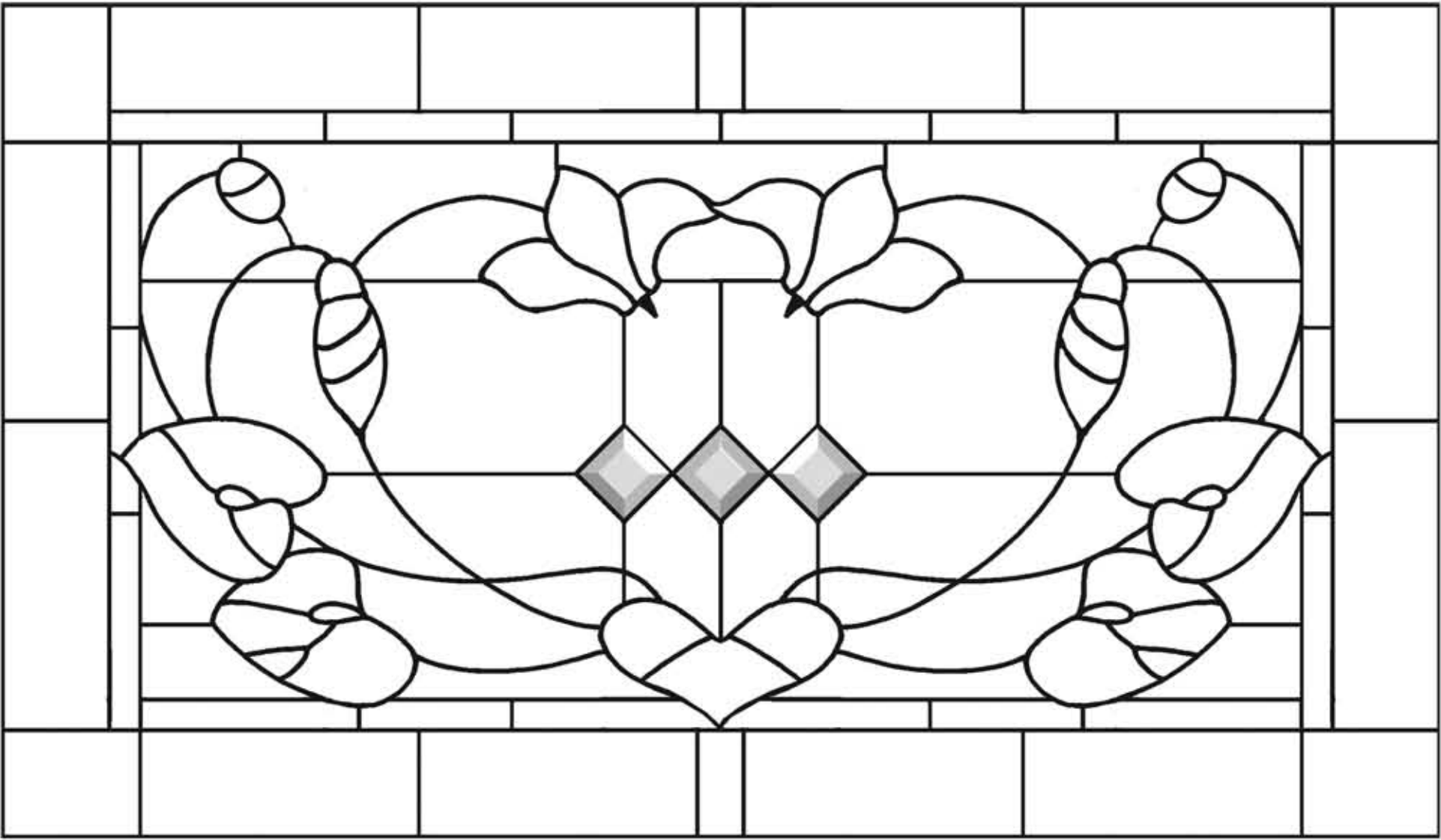
- Pale Green/White for Pulpit Flower, Scrap  
Pale Amber for Skull, 1/4 Sq. Ft.  
Dark Leaf Green for Tree, 1/4 Sq. Ft.  
Medium Amber for Tree Trunk, 1/8 Sq. Ft.  
Sky Blue for Sky, 1/4 Sq. Ft.  
Irid Green for Trillium, Scrap  
Solar Bronze for Border, 1/2 Sq. Ft.  
Green/Dark Amber Opal for Ground, 1/4 Sq. Ft.  
Purple for Flowers, Scrap  
Green for Small Leaves, Scrap



Enlarge to desired size





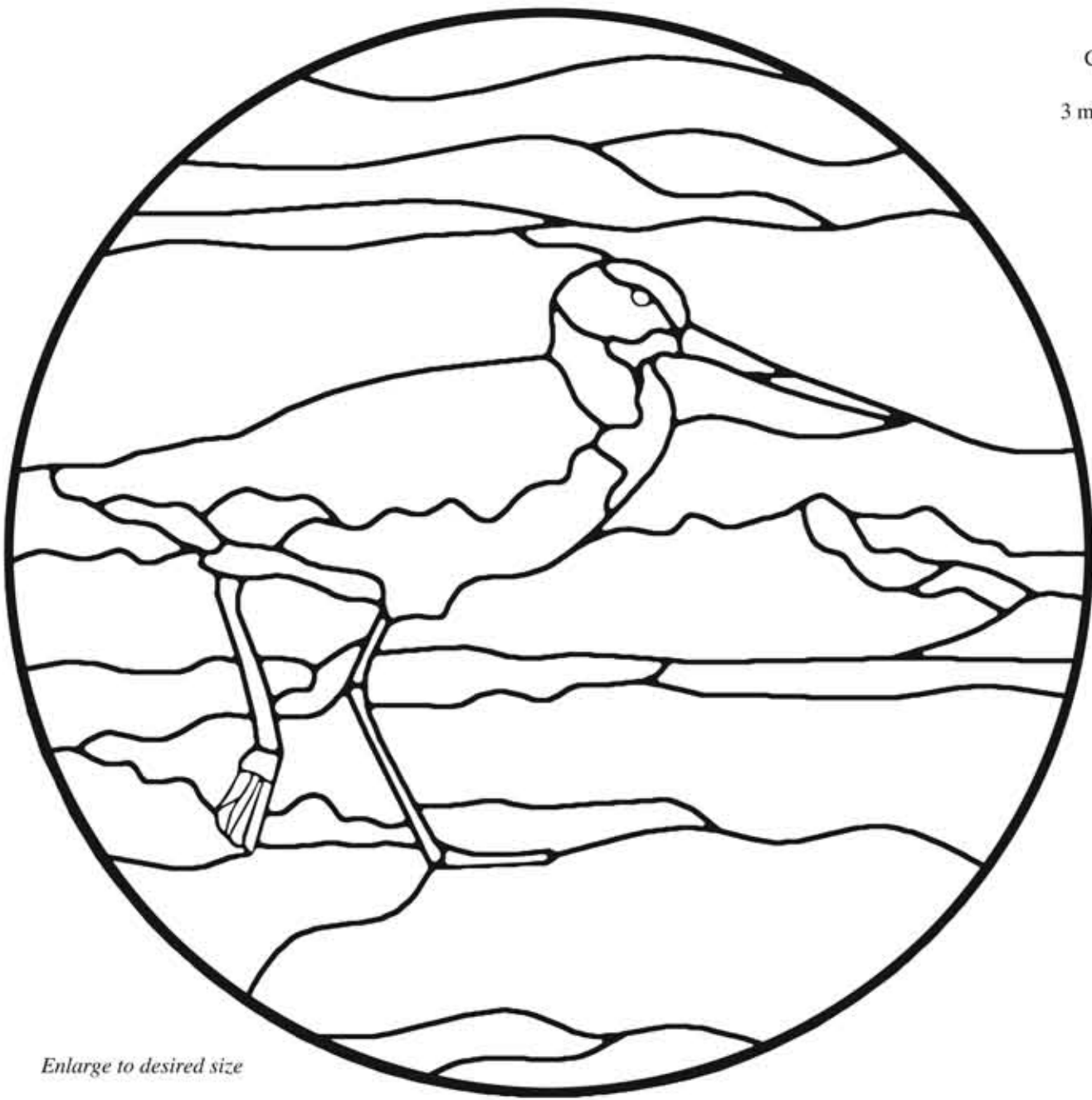


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## Cyclamen

Design by Chantal Paré

**Youghioheny Opalescent Glass**  
1000 HS L Soft White Opal Cotton Ball  
for Outer Edge, 1/2 Sq. Ft.  
1660 SP Ice White and Sea Blue  
for Inner Edge, 1-1/2 Sq. Ft.  
1007 SP Ice White with Pink Stipple  
for Flowers, Scrap  
Various Green Mixes for Leaves, Scrap  
**Wissmach Glass Co.**  
Clear Seedy Top Row Background, 1 Sq. Ft.  
**Additional Glass**  
3 mm Clear Float Glass for Background, 2 Sq. Ft.  
3" x 1" Bevels for Accents



Enlarge to desired size

## Sandpiper

Design by Paned Expressions Studios

**Wissmach Glass Co.**  
223-LL Light Amber/Dark Brown Streaky  
for Bird Wing and Throat, 1/2 Sq. Ft.  
325-D Light Amber/Dense Opal/Crystal  
for Breast and Head, Scrap  
155-LL Dark Purple/Green/Light Opal/Crystal Streaky  
for Beak, Legs, and Feet, Scrap  
272-D Dense Opal/Light Blue/Mauve for Sky, 1-1/2 Sq. Ft.  
272-L Light Opal/Light Blue/Mauve for Clouds, Scrap  
563-L Steel Blue/Light Opal/Crystal for Water, 1/2 Sq. Ft.  
65-L Medium Brown/Blue/Light Opal for Beach, Scrap  
502-L Light Opal/Medium Gray/Brown for Beach, 1 Sq. Ft.

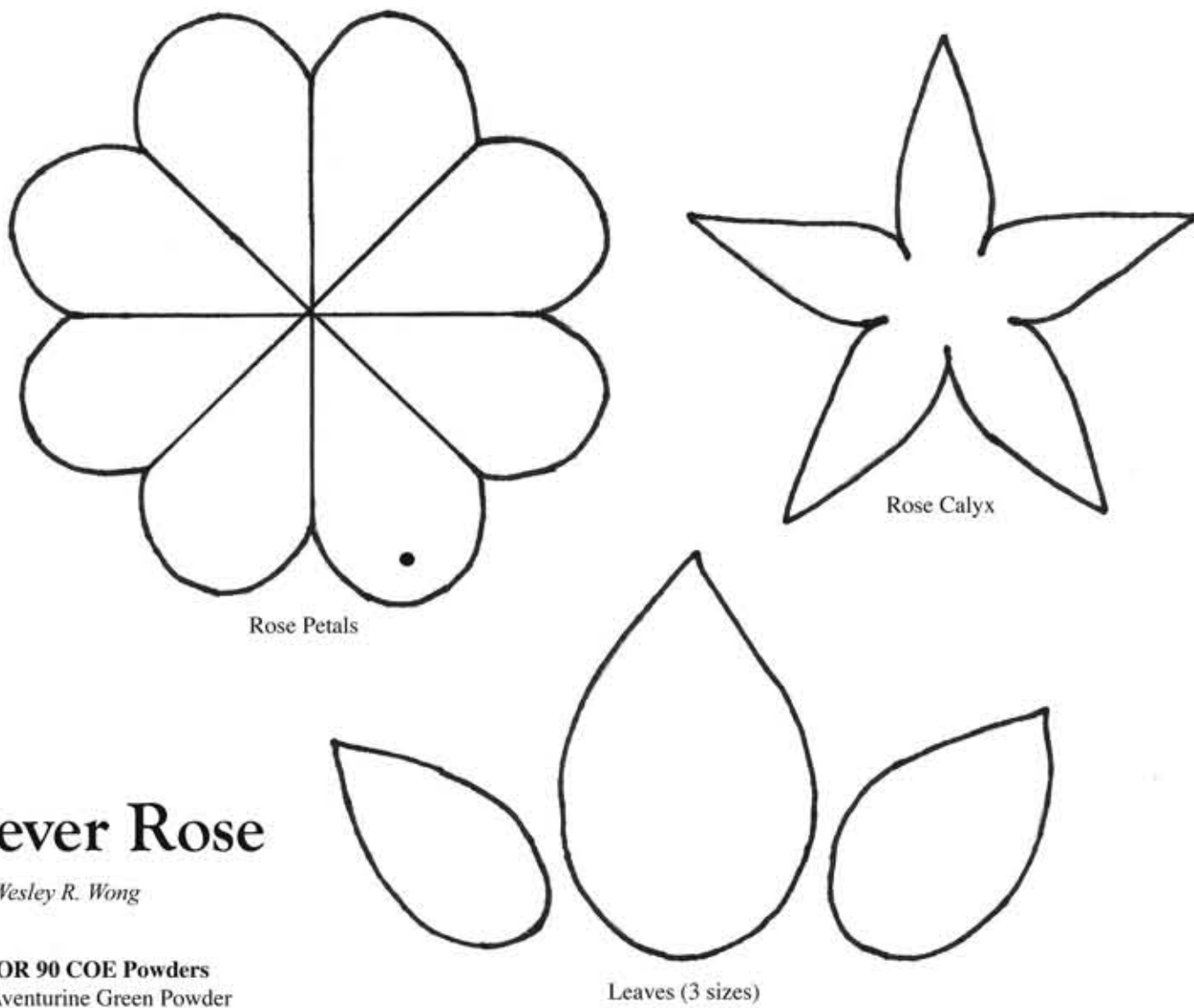


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## The Forever Rose

Design by Wesley R. Wong

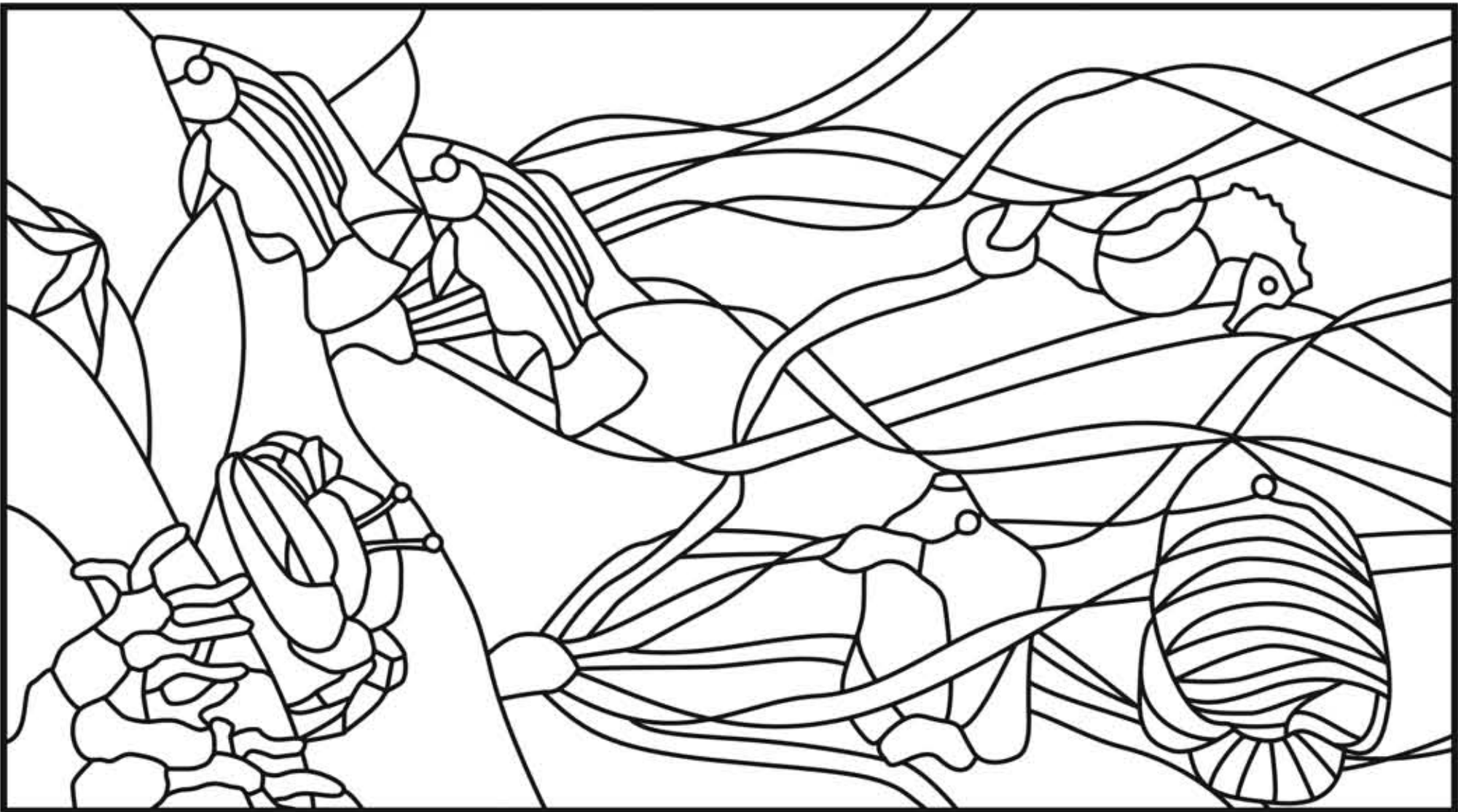
**96 COE Powders OR 90 COE Powders**  
Dark Green Opal or Aventurine Green Powder  
Desired Color of Opal Powder



## Deep Sea

Design by Aamraku Glass Studios,  
First Rendering by Joel Weise

**Wissmach Glass Co.**  
330-L Light Opal/Crystal/Yellow Green/Blue  
for Background Water, 4 Sq. Ft.  
WO-55 Amber/Green/Opal/Crystal Wispy  
for Sea Floor, 1 Sq. Ft.  
245-L Medium Amber/True Green Streaky/Light Opal/  
Crystal for Sea Floor, 2 Sq. Ft.  
WO-707 Light Blue/Dark Blue Mystic  
for Fish Pair Bodies, Scrap  
272-L Light Opal/Light Blue/Mauve Streaks  
for Fish Pair Fins, Scrap  
1-D Silver Yellow/Dense Opal/Crystal  
for Striped Fish Pair, Scrap  
66-L Dark Purple/Streaky/Light Opal  
for Small Fish Body, Scrap  
67-L Blue Green/Light Opal/Crystal  
for Small Fish Fins, Scrap  
55-L Amber/Green/Light Opal/Crystal  
for Large Fish, Scrap  
W0-28 Orange/Opal Wispy  
for Large Fish Stripes, Scrap  
51-L White/Cast Light Opal Translucent  
for Seaweed, 3 Sq. Ft.  
WO-36 Opal/Salmon Wispy for Coral, Scrap  
1-L Silver Yellow/Light Opal/Crystal  
for Starfish, Scrap  
315-D Medium Amber/Dense Opal  
for Seahorse, Scrap  
WO-706 LL Light Amber/Brown/Opal Mystic  
for Crab, Scrap  
**Tools and Materials**  
7/32" Copper Foil Flux Solder  
Black Patina 1/2" U-Channel Zinc

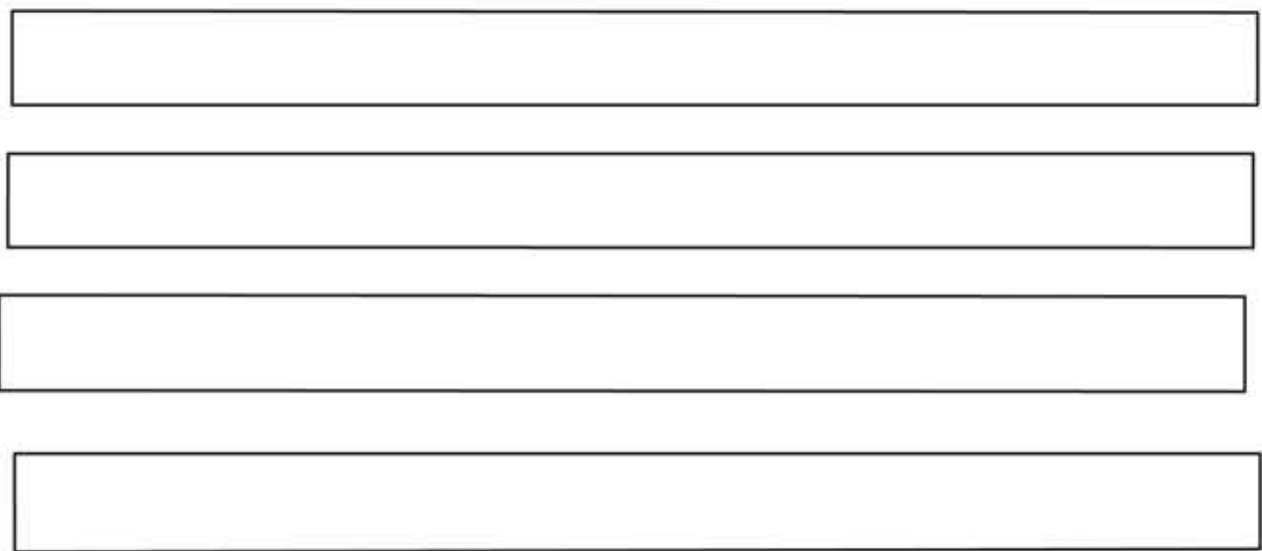


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## Dogwood Lantern

Design by Lisa Vogt

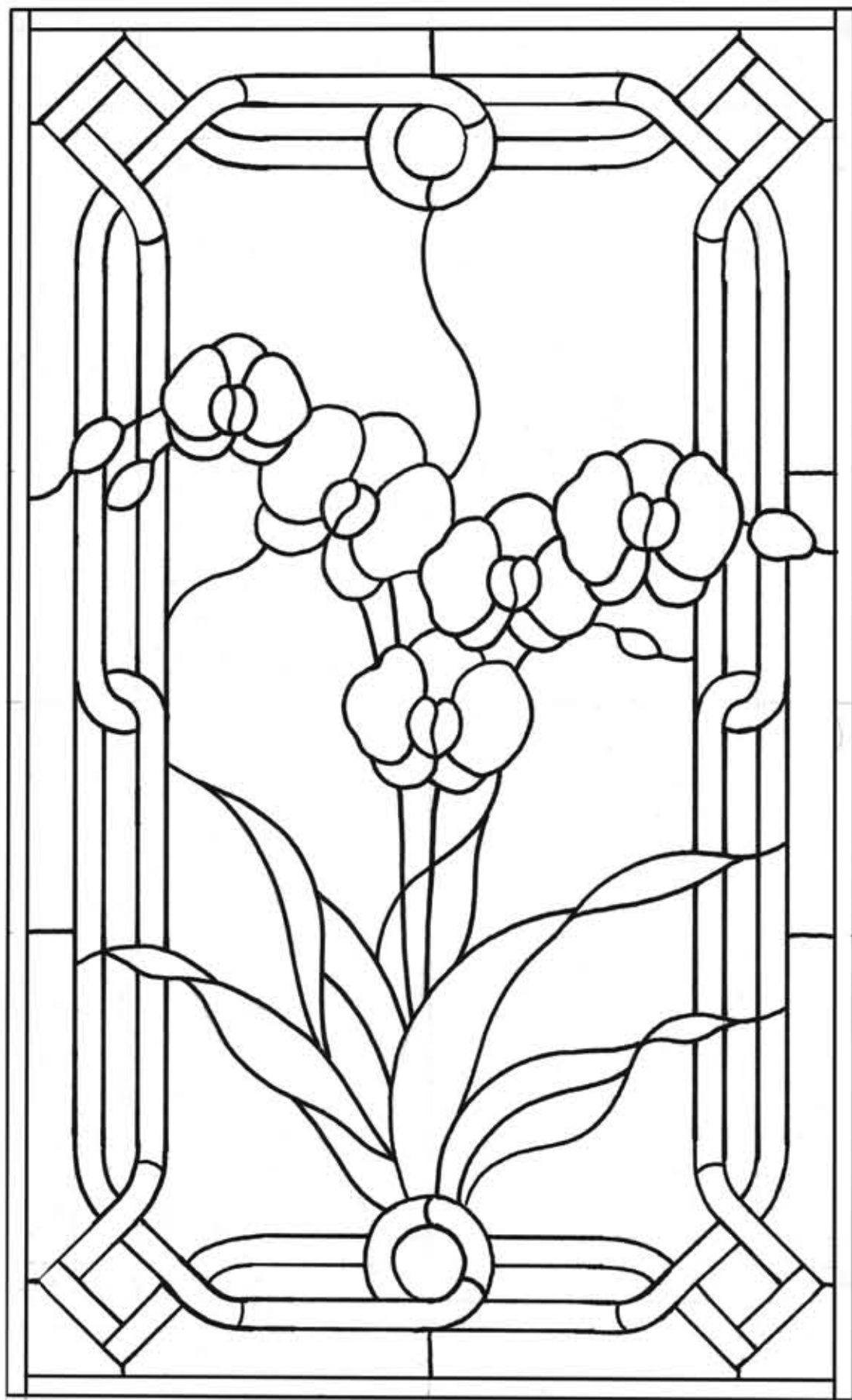
**96 COE Fusible Glass**  
Clear for Lattice and Lantern Bottom, 1 Sq. Ft.  
White for Flowers, 1 Sq. Ft.  
Fern Green/Clear for Leaves, 1/2 Sq. Ft.  
Transparent Yellow for Flower Centers, 1/4 Sq. Ft.  
Fine Opal Yellow Frit for Flower Center Detail  
**Additional Glass**  
1/4"-Thick Clear Glass for Lantern Bottom, 1/4 Sq. Ft.



## Grateful Expressing Appreciation for Friends and Family

Design by Dioné Roberts

**Glass**  
Opal Marigold for Calla Lily, 1 Sq. Ft.  
Iridized Aqua  
for Background, 1-1/2 Sq. Ft.  
Green/Turquoise Opal  
for Stem and Large Leaves, 1-1/2 Sq. Ft.  
Aqua for Large Leaf Accents, 1/2 Sq. Ft.  
Bright Green Cathedral  
for Small Leaves, 1/2 Sq. Ft.

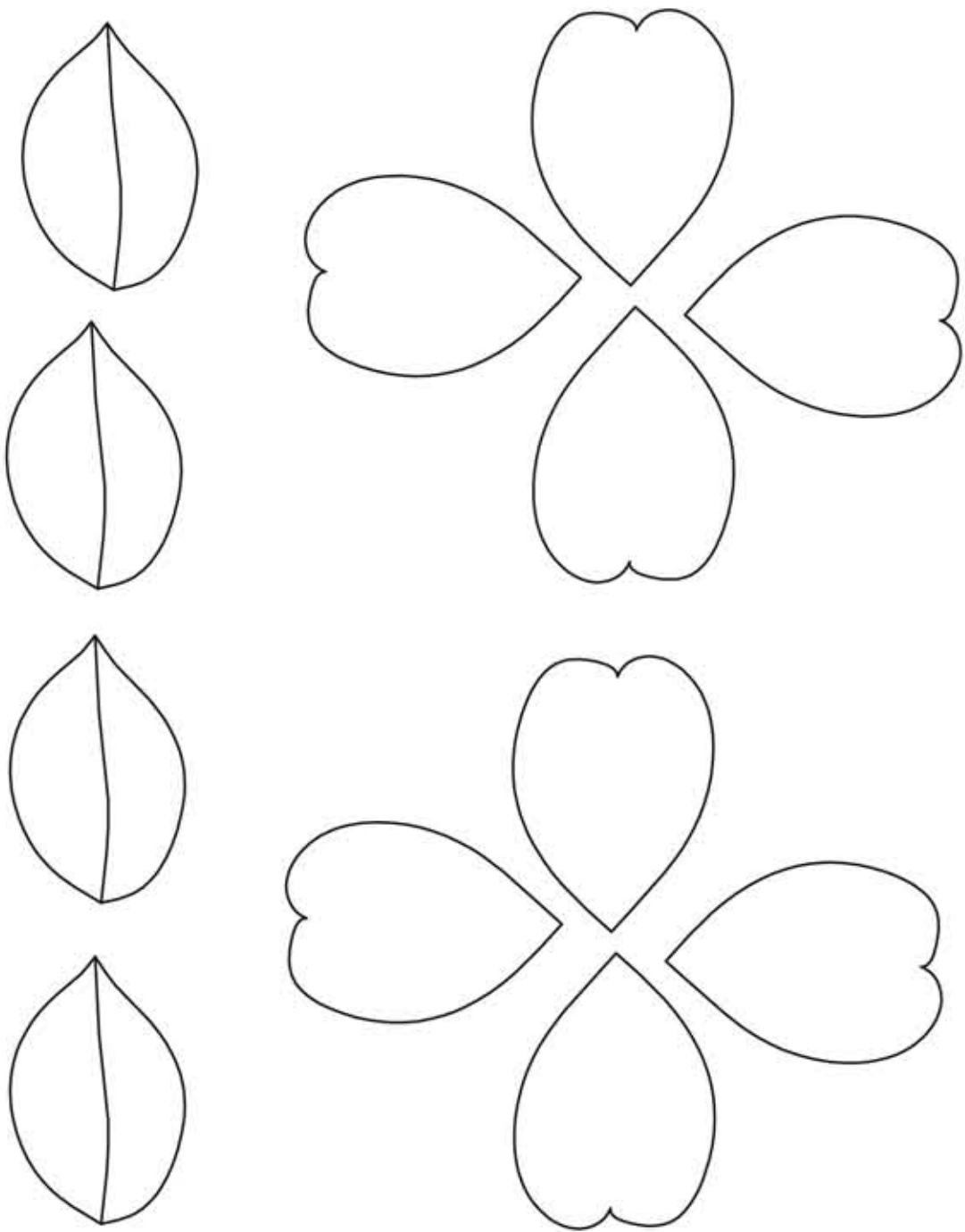


Enlarge to desired size

## Orchid Panel

Design by Justin Behnke

**Wissmach Glass Co.**  
115DR Medium Copper Blue Double Rolled  
for Thin Border, Scrap  
**Youghioheny Opalescent Glass**  
4554 SP Green for Leaves, 3/4 Sq. Ft.  
**Additional Glass**  
Pink on White Ripple for Orchids  
and Round Border Accents, Scrap  
Clear Opalescent Light Green/Pink Streaky  
for Outer Border, 1-1/2 Sq. Ft.  
Light Amber for Background, 1-1/4 Sq. Ft.







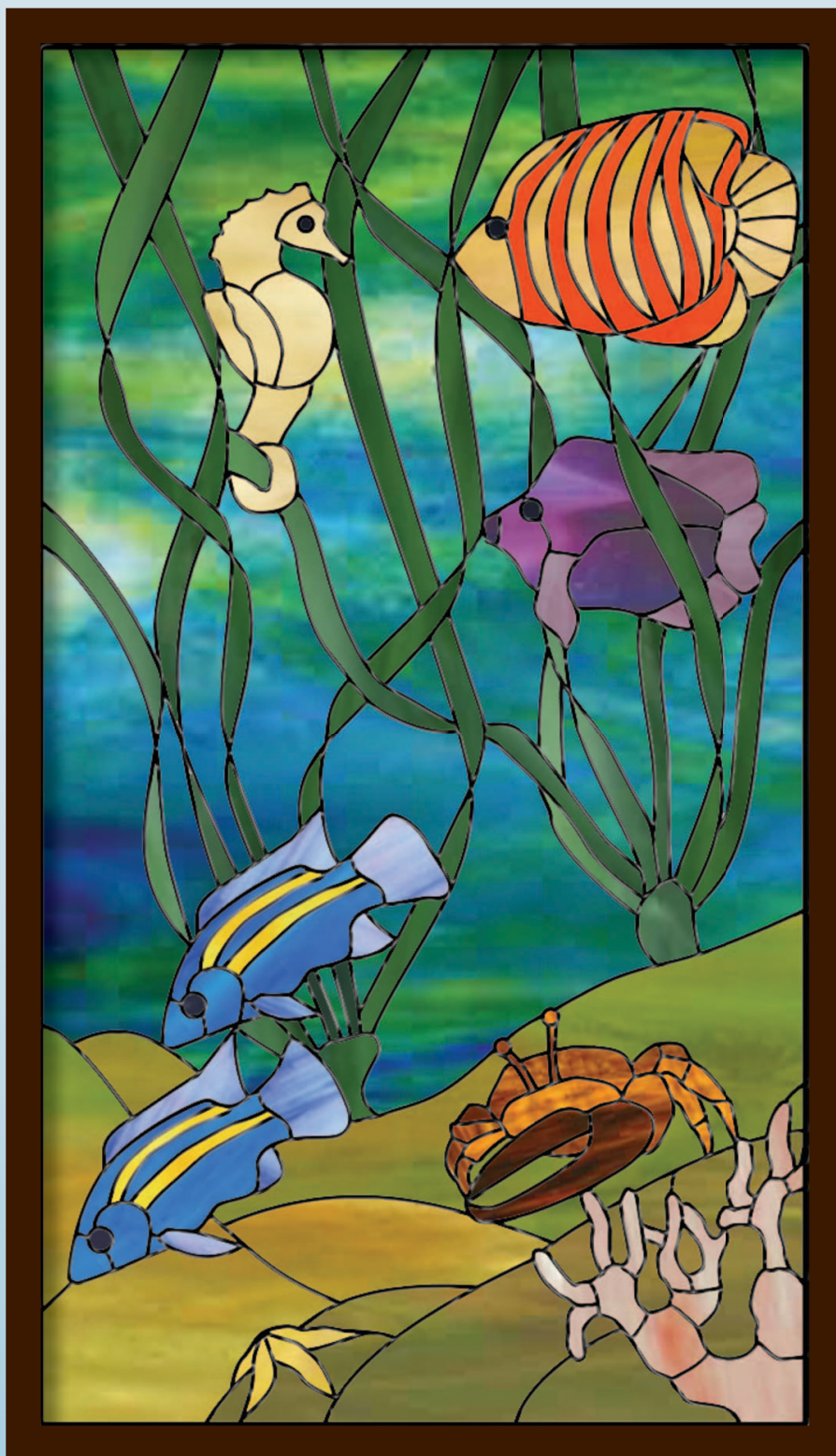
# Deep Sea

*Design by Aanraku Glass Studios, First Rendering by Joel Weise, Text by Darlene Welch*

Celebrate the world of wonder that happens under the sea with this stained glass panel featuring a fascinating gathering of fish and their sea horse and crab companions. This 18" x 32-1/4" stained glass design is the smaller one of two versions that are part of the pattern offerings that can be found in *Aanraku Eclectic: From the Original Collection Volume 1* by Hiroyuki Kobashi and Jeffrey Castaline of Aanraku Glass Studios.

This collection offers a wide assortment of themes in over 25 different designs that include patterns and full-color photos of pansies, maple leaves, water lilies, and kingfishers plus a lighthouse, toucan, prowling tiger, and many more. These superbly detailed designs are created for glass enthusiasts who work at an intermediate to advanced level. Visit [www.aanraku.com](http://www.aanraku.com) to view their complete selection of pattern books and learn more about Aanraku's Custom Pattern and Design Service.

**GPO**





# The Forever Rose

*Design, Fabrication, and Text by Wesley R. Wong*



*“What’s in a name? That which we call a rose  
by any other name would smell as sweet.”  
William Shakespeare from Romeo and Juliet*

Various folk cultures and traditions assign symbolic meaning to the rose, though these are seldom understood in-depth. Examples of deeper meanings lie within the language of flowers and how a rose may have a different meaning in arrangements. Examples of common meanings of different colored roses include true love (red), mystery (blue), innocence or purity (white), death (black), friendship (yellow), and passion (orange).

The rose is the national flower of England, dating back to the English civil wars of the 15th century, later called the War of the

Roses, in which the red rose represented the House of Lancaster and the white rose represented the House of York. The rose is also the national flower of the United States and the state flower of five states—Iowa, North Dakota, Georgia, New York, and Oklahoma—as well as the District of Columbia.

The rose has been around for about 35 million years and grows naturally throughout North America. You can make a rose from glass wafer sheets that appears delicate, will not wilt, can potentially last forever, and is sure to brighten any setting.



## 96 COE Powders OR 90 COE Powders

Dark Green Opal or Aventurine Green Powder

Desired Color of Opal Powder

### Tools and Materials

White Poster Board Blue Poster Board

ThinFire Paper Papyrus® Kiln Shelf Paper

Elmer's® White School Glue Mod Podge® Clear Gloss Sealer

1/8" Fiber Paper 1/4" Fiber Paper

2"-Wide Clear Packing Tape 1" Wide Blue Painter's Tape

Heavy-Duty Clear Sheet Protectors

19- and 20-Gauge Stainless Steel Wire 16- and 20-Gauge Floral Stem Wire

1/2"-Wide Floral Tape 2 Ounce Condiment Cups 8 Ounce Paper Cups

1-1/2" Clay Pot 1"- Thick Floral Foam Block Craft Sticks

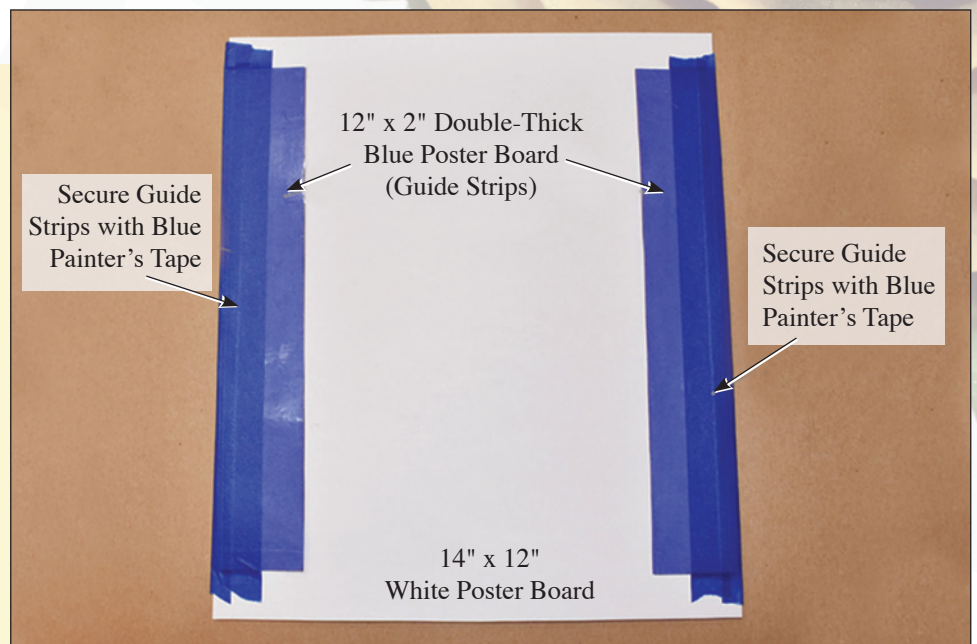
Plastic 12" Ruler Tweezers Sharpie® Marker Sharp Craft or Sewing Scissors

Pen or Pencil Artist Paintbrush Needle Nose Pliers Wire Cutter

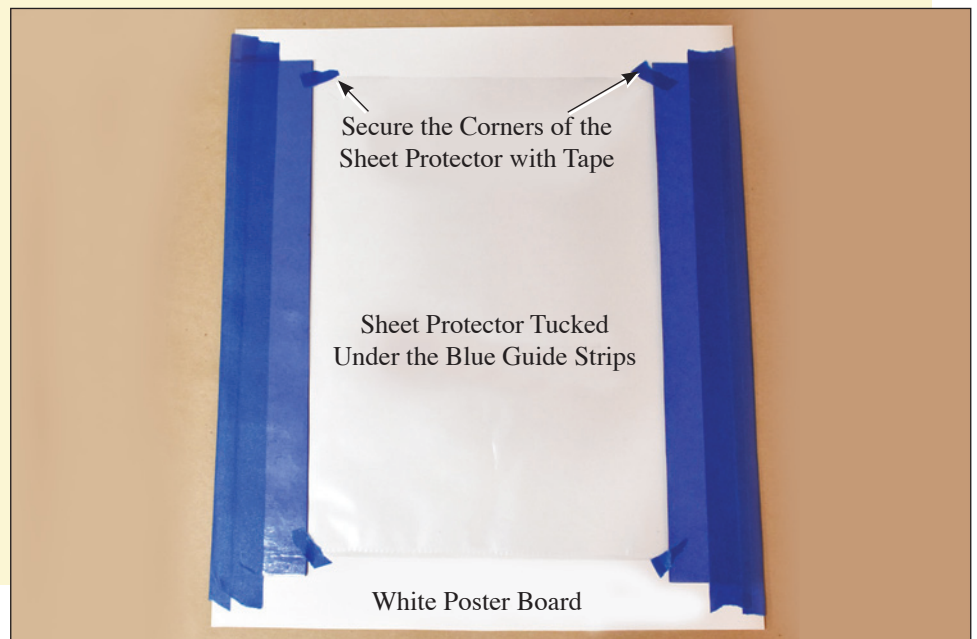
Embossing Heat Tool 1/4" Wood Dowel, 6" Long

### Preparing the Layout Board

Cut a 14" x 12" piece from the white poster board. Cut two 12" x 4" strips from the blue poster board. Crease the blue strips in half lengthwise. Apply glue to the inside of the folded strips and glue the strips closed to produce a double-thick 12" x 2" strip. Cover both sides of each strip with clear packing tape. Center the blue strips along the edge of the white poster board base and attach them with the blue painter's tape.



Tuck the plastic sheet protector under the blue guide strips and secure the corners with blue tape to the white board to prevent it from shifting. Tape the white board to the work surface to prevent it from slipping.

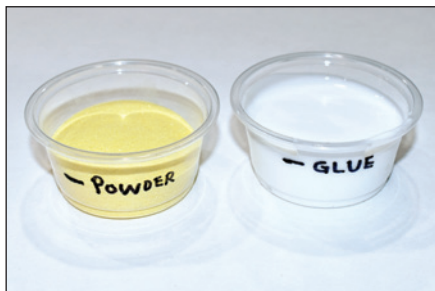




## Preparing the Wafer Sheets

1

*Measure the powder and glue.*



Mark one of the 2 ounce condiment cups half way down with a Sharpie marker and label it for the powder. Spoon your choice of colored powder to that line for approximately 1 ounce of powder. I am using Pumpkin Orange opal powder for the rose in this tutorial.

Mark a second 2 ounce condiment cup a fourth of the way from the top with the Sharpie marker and label it for the glue. Pour the white glue to that line for approximately 1.8 ounces of glue.

2

*Combine the powder and glue into an 8 ounce paper cup to create a powder slurry.*



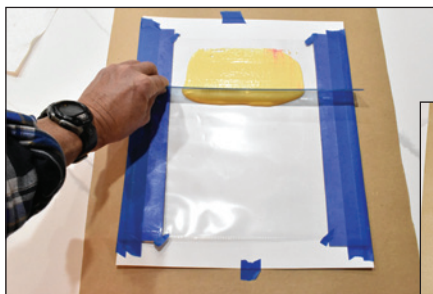
Stir the mixture thoroughly with a craft stick, adding more glue as needed until it has a creamy, drippy consistency.

3

*Carefully scoop the powder slurry with the craft stick onto the top center area of the sheet protector and spread it out evenly.*



Allow at least 1" of clearance from the guide strips.



*Prepare the wafer sheets.*

4



Place the edge of the plastic ruler above the powder slurry blob. The ruler should span across the width of the plastic sheet resting on both sides of the blue guide strips. Grip both ends of the ruler, press gently onto the guide strips, and glide the ruler down the sheet protector, thinning out the powder slurry.

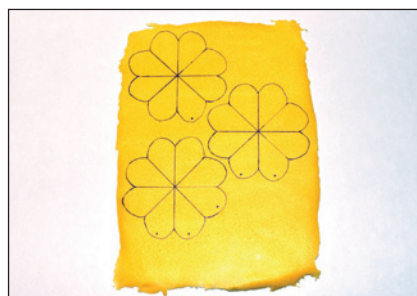
Before reaching the end of the sheet, lift up the ruler and scrape off any extra slurry from the ruler into the paper cup. Turn the ruler around and run the ruler over the slurry from the bottom up to smooth out the slurry. Stop before reaching the top of the sheet protector and scrape off any excess. The slurry should now appear smooth and even, with no thin spots or blotchy areas. If needed, make one more pass of the ruler to smooth out the slurry.

Remove the pieces of tape anchoring the four corners of the sheet protector. Carefully slide the sheet protector away from the guide strips and set it aside to dry. Let the slurry dry for approximately 20 hours to produce a wafer sheet. The dried wafer sheet will have a matte finish and can slide easily off the plastic sheet protector. Do not try to peel the powdered wafer off of the plastic sheet, since that will create blotchy areas. Repeat steps 1 to 4 with the dark green opal powder for the calyx and the leaves.

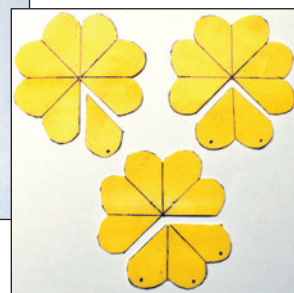
Store the dried wafer sheets inside the sheet protectors. Label the sheet protectors with the color and COE of the glass for later reference. This is helpful when creating multiple sheets of various colors and storing them for an extended period of time.

## Constructing the Rose

5



*Trace and cut out the wafer sheet petal and calyx pieces.*

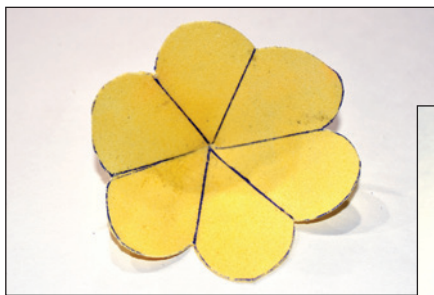


Transfer the flower, calyx, and leaf patterns onto card stock. Make three copies of the flower pattern. Lay out the three copies on the smooth side of the wafer sheet and trace the pattern onto the wafer with a pen or pencil.

Draw the intersecting lines. Each flower pattern contains a cluster of 8 petals. Mark a dot on the bottom petal of the top pattern, a dot on the bottom two petals of the middle pattern, and a dot on the bottom three petals of the last pattern.

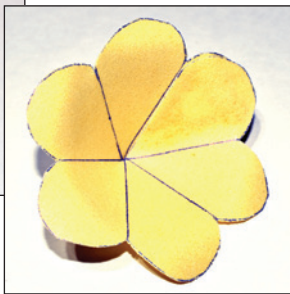
Cut along the edge of each petal cluster with a pair of scissors. Cut out the petal with the single dot from the first cluster. Cut out the petal group with the two dots from the second cluster, then cut out the petal group with the three dots from the third cluster. There are now six sets of wafer petal groups with 1 petal, 2 petals, 3 petals, 5 petals, 6 petals, and 7 petals. Trace the calyx pattern onto the green wafer sheet and cut it out with the scissors as you did for the petals.





6

*Bend and glue the 7-petal wafer cluster into a cone shape.*

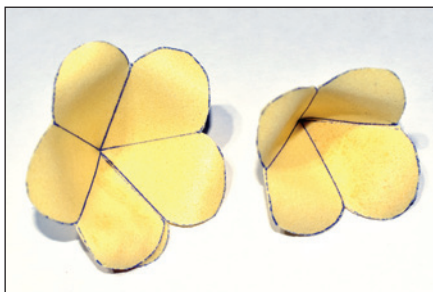


Hold the 7-petal wafer cluster with tweezers in one hand and heat the wafer from both sides with the embossing heat tool for about 10 seconds to soften the wafer. Slowly and carefully bend and shape the wafer into a cone shape, overlapping and gluing the two end petals to close the gap, forming a 6-petal cone. If the wafer is too stiff to bend, apply more heat to the wafer.

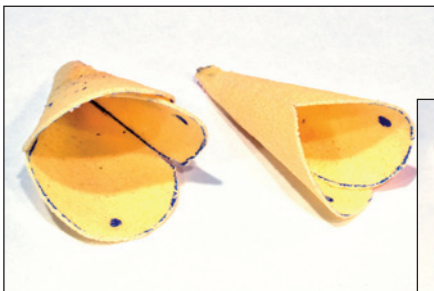
Now heat the tips of the petals, 1 or 2 at a time, for about 10 seconds and gently curl the tips with the 1/4" dowel. **Caution:** Do not use a standard heat gun in place of the embossing heat tool, because a standard heat gun operates at much higher temperatures (750°F–1000°F vs. 400°F), and there is the potential to burn yourself and the wafers.

*Repeat step 6 with the 6-petal and 5-petal wafer clusters to form a 5-petal cone and a 4-petal cone.*

7

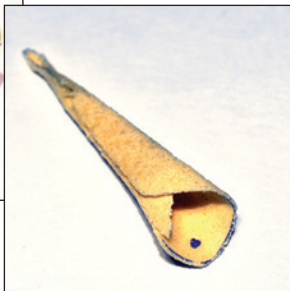


There should be no gaps at the tips of the cones.



8

*Heat, shape, and glue the 3-petal and 2-petal clusters.*



Heat the 3-petal wafer and carefully curl and shape the wafer with the 1/4" dowel into a 2-1/2" cone by overlapping and gluing the two end petals halfway only. Heat the 2-petal wafer and carefully curl and shape the wafer, using the tip of a paintbrush, into a small cone by overlapping and gluing the two end petals by 1/4 only.

Carefully heat, curl, roll, and glue the single petal wafer into a cone. Place the sharp end of a thin paintbrush into the center of the cone to help glue it together. This is the trickiest piece to roll, curl, and shape because of the small size. If the wafer falls apart in the process, cut another single petal wafer from the remaining wafer sheet and try again.

9

*Prepare the 19-gauge wire for the stem.*



Cut a 4" length of the 19-gauge stainless steel wire. Using a needle-nose plier, bend and crimp a small loop at the end of the wire. Bend the loop at a 90-degree angle to create a hooked loop that will be used for the stem of the rose.

10

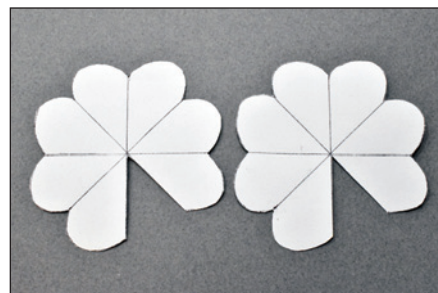
*Attach the calyx.*



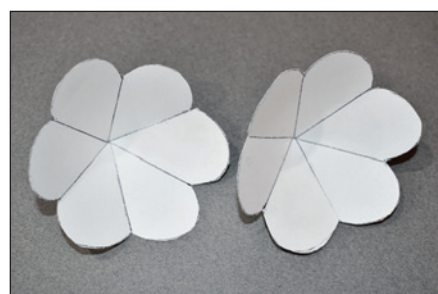
Poke a hole in the center of the 6-petal cone and calyx with the wire stem. Position the calyx behind the cone and glue the calyx in place. Remove the wire stem after the calyx has been firmly glued.

11

*Prepare the Papyrus paper.*

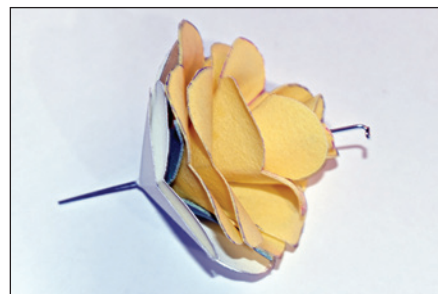


Trace 2 sets of flower patterns onto the Papyrus paper. Cut out the pattern and remove the lower right petal. Shape the paper into a cone, overlapping the two inner petals, and glue into place.



12

*Nest the 6 cones of petals and glue them together.*





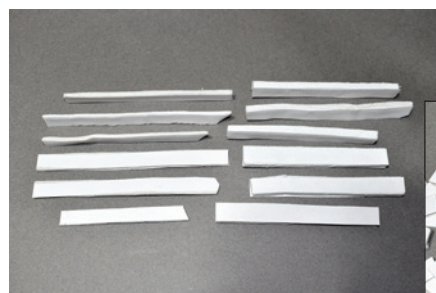
Feed the wire stem down the center of the smallest cone. Apply glue to the tip of the cone and nest it into the next size cone, feeding the wire stem through the center of that cone. Continue nesting and applying glue to the cones until all 6 cones are nestled together with the wire running through the center of each cone. Finally stack the two Papyrus paper cones through the wire stem behind the whole cone stack.

# 13

*Secure the rose assembly to the clay pot and floral foam block.*



Set the rose assembly onto the 1-1/2" clay pot, feeding the wire stem through the hole in the bottom of the clay pot. Place the pot on the floral foam block and push the wire stem through the center of the flower with the sharp end of a thin paintbrush to secure it firmly into the foam block.



# 14

*Prepare the fiber paper wedges.*



Cut four to six 1/2"-wide strips of the 1/4" and 1/8" fiber papers about 4" long. Cut 2 sets of ThinFire paper strips to match each strip of the fiber paper. Glue the ThinFire paper to each side of every fiber paper strip, with the glue applied to the watermark side of the paper.

Cut the layered fiber paper strips into wedges about 1/2" wide. Create a pile for the 1/8"-thick wedges and another pile for the 1/4"-thick wedges, or sort them into separate containers.



# 15

*Insert the fiber paper wedges between the sets of petals.*



Insert the 1/4"-thick wedges between the bottom two sets of petals. The spaces between the petals may need to be widened with the tweezers to make room for the wedges, which do not need to be glued in place. The pressure from the petals will hold them in place. Gluing the wedges in place may leave a residue on the petals after firing that will become harder to clean off later.

Insert the 1/8"-thick and 1/4"-thick wedges between the next two sets of petals, then insert the 1/8"-thick and 1/4"-thick wedges between the next four sets of petals.



# 16

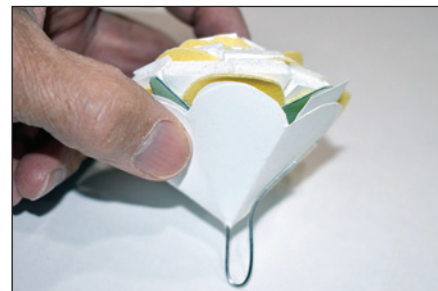
*Deposit a small scoop of powder into the center cone to completely cover the wire stem.*



The powder can be the same color as the petals or a contrasting color.

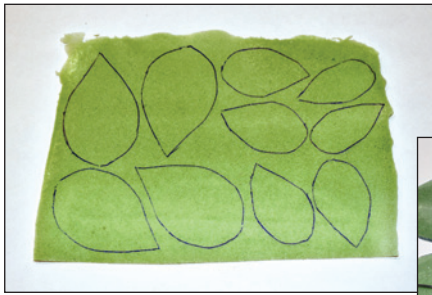
# 17

*Carefully lift the flower assembly off of the clay pot and bend the wire stem into a U-shape.*



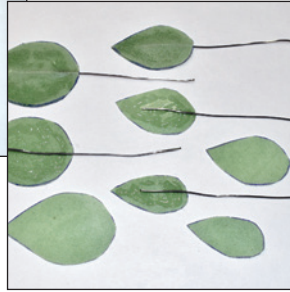
Set the completed rose into the 1-1/2" clay pot and place it in the kiln.





18

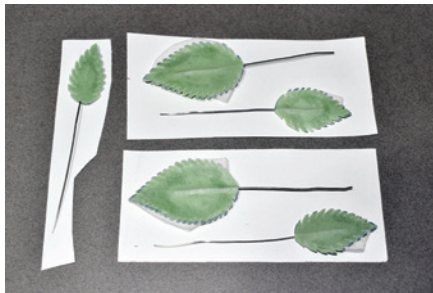
*Cut out the leaves from the green wafer sheet and glue on the wire stems.*



Trace 5 pairs of leaves onto the smooth side of the green wafer sheet, cut out the leaves, and pair up the similar size leaves. Next cut 5 pieces of 20-gauge stainless wire 4" long. Sandwich and glue the wires between each pair of wafer leaves.

*Serrate the leaves by cutting small notches along the edges of the leaves, starting from the tip down to the stem.*

19



Lay the leaves on shelf paper and tuck small scraps of 1/8" fiber paper under the leaves to add movement to the leaves.

20

*Tack-fuse the completed rose.*



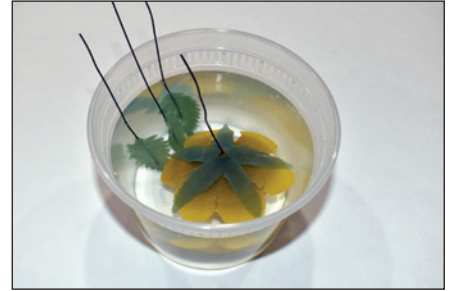
Place the completed rose in the clay pot and the leaves in the kiln and fire to the following suggested tack fuse schedule. Remember, however, that all kilns fire differently, so you may need to alter the schedule to fit your own particular kiln.

Segment 1: Ramp 450°F/hr to 400°F and hold 5 min.  
Segment 2: Ramp 575°F/hr to 1270°F and hold 5 min.  
Segment 3: Ramp 9999 (AFAP\*) to 950°F and hold 30 min.  
Segment 4: Ramp 175°F/hr to 750°F and hold 10 min.  
\*as fast as possible

## Cleaning Up and Assembling the Rose

21

*Clean off any fiber residue.*



Remove the fired rose and leaves from the kiln. Straighten the wire stem and carefully remove all of the fiber paper and Papyrus paper. Soak the rose and leaves in a container of clean water until the fiber residue has been dissolved, probably around 15 minutes.

Remove the rose and leaves from the water and let them dry completely. Any remaining residue can be scraped off with tweezers or a dental pick.

22

*Apply the Mod Podge clear gloss sealer.*

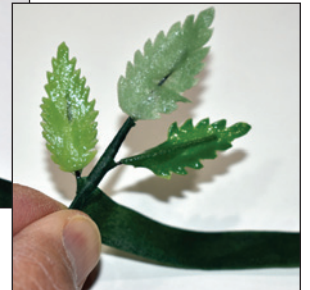


The rose and leaves will have a matte finish. Coat a layer of clear gloss Mod Podge sealer on all surfaces of the rose and leaves with a paint brush. The Mod Podge will dry clear and produce a shiny surface that will seal and harden the glass wafer.

23



*Attach the leaves to the wire stem with floral tape.*



Cut a 5" length of the 20-gauge floral stem and attach a leaf to the end of the wire with the floral tape. To activate the adhesive on the floral tape, the tape must be stretched while wrapping around the wires.

Attach the next two leaves to the same stem about 1/2" below the top leaf and angled from the center stem. Continue wrapping the floral tape until all of the leaf wires are covered.



24

Repeat the previous step for a 2-leaf branch.



25

Cut a 9" to 12" length of the 16-gauge floral stem for the rose and leaf branches.



Attach the rose to the stem with the floral tape.



26



Attach the 2- and 3-leaf stems to the main stem.

Bend the 2-leaf branch at a 45° angle and attach it to the main floral stem about 1" below the rose. Next, bend the 3-leaf branch set at a 45° angle and attach it to the main floral stem about 1-1/4" below the rose.

Continue wrapping the floral tape until all of the leaf stems are covered and seal the end of the floral tape with a dab of glue. More leaves can be created and attached to the main stem for a fuller looking rose. Create several roses for a rose bouquet! **GPO**



### Paper Roses

The glass rose project, which is a complex process with many steps, took over 18 months to develop and refine. It evolved from the paper rose. I strongly recommend studying the process first and creating a few paper roses before tackling the project with the glass powders.

The petals and leaves are cut from colored card stock, shaped, and glued onto a wire stem to create a lovely paper rose. The rose construction and assembly steps for the glass rose can be adapted and simplified for the paper rose.

Wesley R. Wong is an award-winning artist who designs and produces custom glass art from his studio in San Jose, California. His passion for glass started in 1981 with stained glass, which eventually lead him into mosaics and fused glass. His work features lots of bright colors and intricate patterns and has been exhibited in many juried glass and mosaic shows throughout the United States.



Wesley, who teaches glass workshops around the country and internationally, enjoys creating new techniques and sharing his glass knowledge with other artists. He was scheduled to teach the techniques from this article in a two-day class at the 2020 Glass Craft & Bead Expo in Las Vegas, Nevada, when the coronavirus pandemic hit the United States, putting all Expo classes on hold. He plans to teach this class when the Expo resumes again in the near future.

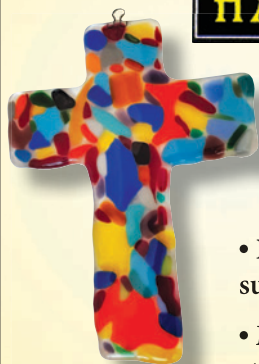
During the COVID-19 lockdowns, Wesley revived his juggling skills, a hobby that began in the 1980s but had gone dormant for over 30 years. The artist also worked on a memoir of his father, who was a prominent businessman and civic leader in San Francisco Chinatown. His father was selected in 1987 by the San Francisco Examiner for the paper's centennial issue as one of the most memorable San Franciscans of the previous 100 years.

Visit Wesley's studio website at [www.glasstastique.com](http://www.glasstastique.com) to view more of his work. For more information on workshops, you can contact him by e-mail at [glasstastique@gmail.com](mailto:glasstastique@gmail.com).

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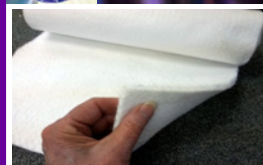
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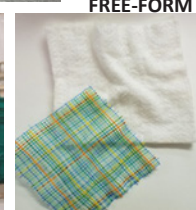


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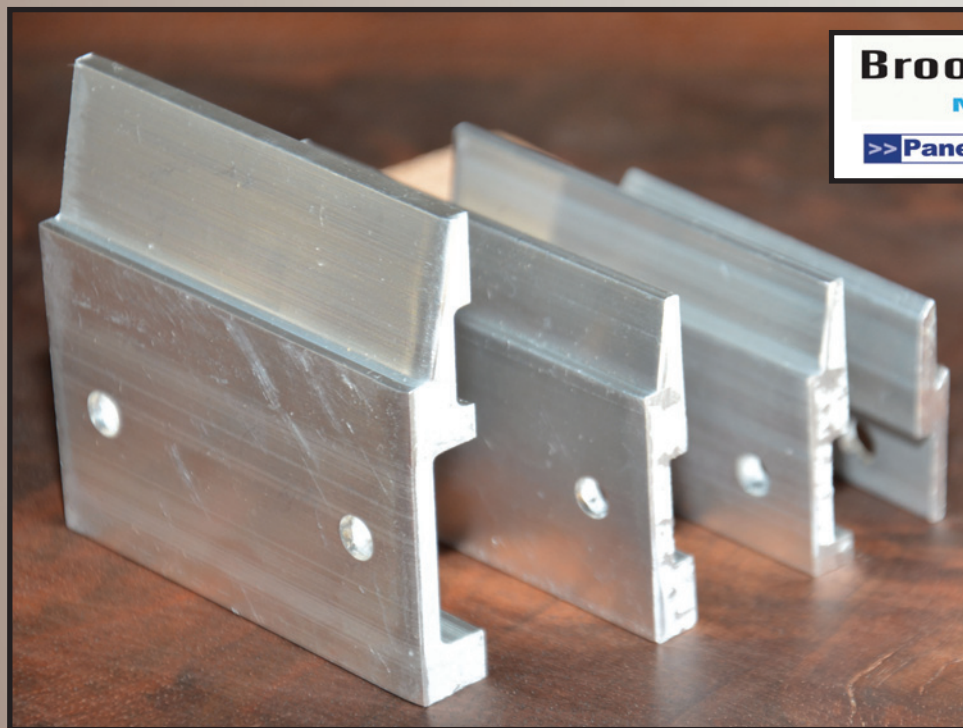
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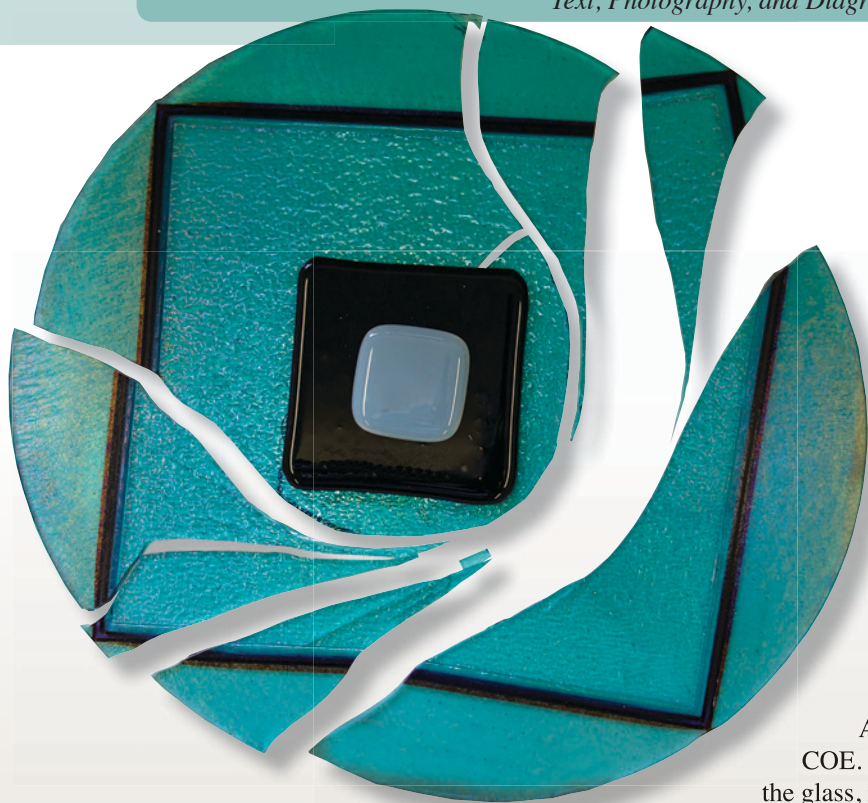
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# Taking the Shock Out of the Brittle Zone

Text, Photography, and Diagrams by Bob Leatherbarrow



*(Figure 1) Explosive breakage at 700°F due to thermal shock. Note how the break wraps around the thicker area with the dark square.*

Most breaks that occur during firing in the kiln are the result of thermal shock. They occur while the glass is initially heating through the brittle zone, the temperature range between room temperature and about 1000°F. The shape of a glass break is generally a sweeping curve that cuts across all colors, does not follow the boundary between the colors, and is commonly associated with changes in thickness of the glass. The pieces may be separated and appear to have blown apart (Figure 1). With an understanding of how glass behaves during this initial heating, it is possible to design a firing schedule that reduces or eliminates the chance of thermal shock.

## The Cause

Thermal shock is directly related to heating through the brittle range. The two physical properties of glass that contribute to thermal shock are that glass is a poor conductor of heat, and as it heats, it expands at a fixed rate determined by the Coefficient of Expansion (COE).

This simple demonstration shows how glass is a poor conductor of heat. You can hold a glass rod with one end in the flame of a torch for a very long time before the heat works its way toward your hand. Now replace that glass rod with a copper rod. It won't be long before the rod is too hot to hold. Even though a sheet of glass is only 1/4-inch thick, it takes a relatively long time for the heat to conduct to the center of the glass.

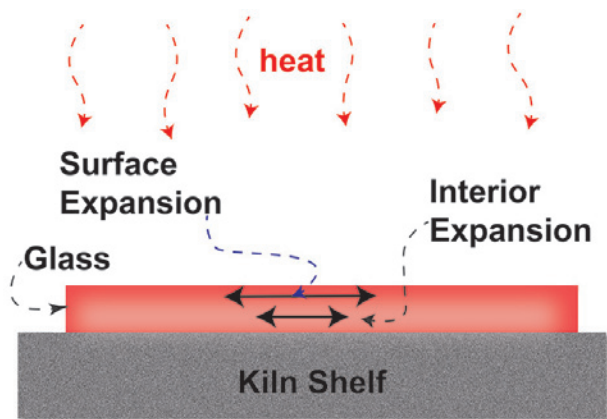
As glass heats, it expands at a rate controlled by the COE. If the surface of the glass is hotter than the interior of the glass, it will expand more than the interior (Figure 2). If the piece is thin, then the differential expansion might not be enough to cause breakage. With increasing glass thickness, the poor heat conduction may result in significantly less expansion in the interior compared to the glass surface. If the differential expansion becomes greater than the strength of the glass, it breaks. The sudden release in stress can blow the project into pieces.

If the glass varies in thickness or if there are design elements lying on top of the base glass, the heat takes more time to conduct into the thicker parts of the glass. Design elements that lie on top of the glass, say for a tack fuse firing, actually act as a thermal blanket and slow the rate of conduction of heat into the glass immediately underlying the element. Therefore the expansion of the glass interior under the element will be less than that of the glass interior throughout the rest of the piece (Figure 3). The break in this situation commonly passes directly through or around the thickest part of the project or where the tack fuse design element lies on top (Figure 1).

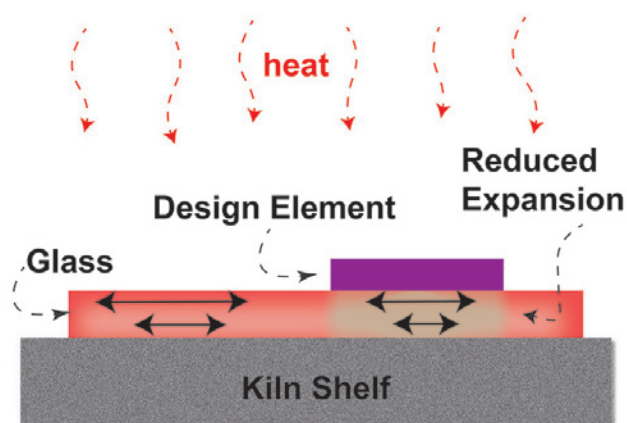
The rate of heat conduction also depends on the viscosity of the glass. Heat conducts into low viscosity "soft" glass faster than into high viscosity "hard" glass. Therefore, differential stress can develop in pieces that have an extreme range of glass viscosities.

The closer the glass is to the heating elements, the greater the impact of heat on the glass. If a glass blank is placed on a slumping mold very close to the heating elements in the lid of the kiln, the parts of the glass surface close to the elements will heat more quickly, thus expanding more quickly than the surface glass between the elements. This, too, can cause thermal shock.





(Figure 2) Differential expansion due to poor heat conduction through glass



(Figure 3) Increased differential expansion due to changing glass thickness

## The Cure

In my experience, thermal shock happens somewhere between 500°F and 700°F. I believe that the glass has to get hot enough so that the differential expansion between the interior and exterior of the glass becomes critical.

Heating kiln formed glass through the brittle zone can be equated with commuting to work in a car. The intention is to drive to work safely without having an accident. A typical firing schedule for heating glass through the brittle zone for pieces up to 1/4-inch thick includes a ramp rate of 300°F per hour through the brittle zone. Under some of the circumstances described above, this ramp rate can cause thermal shock, since the glass has been heated too quickly. Using the “commuting to work” analogy, we have had an accident. How do you avoid accidents? Slow down and stop if necessary.

If there is a threat of thermal shock from one of the conditions outlined above, then the easiest solution is to take a cautious approach and slow the ramp rate to 250°F per hour or 200°F per hour. That will allow more time for the heat to conduct into the glass interior and keep the differential expansion to an acceptably low level.

When an even more cautious approach is needed, a 20- or 30-minute soak or temperature hold can be included at 500°F, the temperature above which I believe thermal shock occurs. This soak allows heat to conduct into the glass, and as the surface and interior temperatures equilibrate, the differential expansion is reduced. Therefore, the stress is released and the likelihood of thermal shock is reduced. In extreme conditions, a second soak could be included at 700°F to relieve any new stress that might have been introduced while heating above 500°F. The ramp rate throughout the brittle zone between and above any soaks should be one of the cautious ones noted above.

If the glass is on a mold and close to the heating elements in the lid, maximize the distance between the lid and the glass surface by removing the kiln shelf and placing the mold on narrow posts directly on the kiln floor. The narrow posts will allow air to circulate under the mold throughout the firing cycle. Another way to reduce the likelihood of thermal shock when glass is close to the heating elements in the lid is to decrease the percentage of power to the lid elements. This reduces the heating from above and increases it from the sides and underneath. I generally set my percentage power to 50 percent. Check to see if that option is available for your controller. If you do use this option, remember to reset it to 100 percent before returning to regular firing programs.



Bob Leatherbarrow, White Shield with tack fused design elements



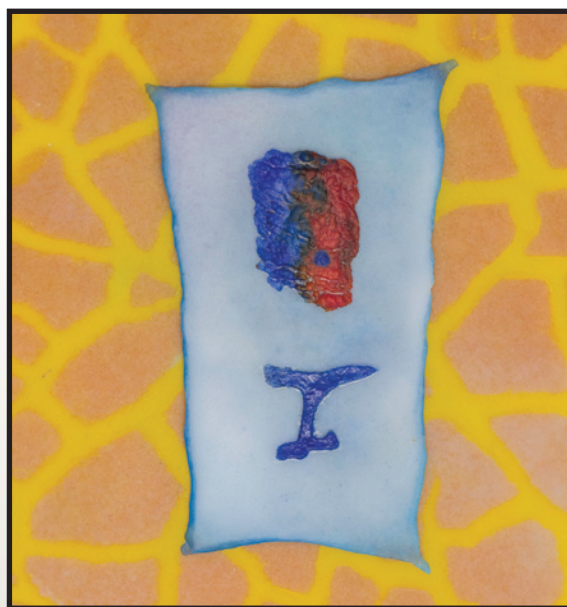
## One Last Look

Please note that ramp rates and soaks are suggestions only. The degree of caution required depends on the “cry factor”—how disappointed you will be if the project breaks. For one-of-a-kind projects, commissions, projects that involve expensive glass, or challenging designs, use this cautious approach for heating through the brittle zone.

For projects that are susceptible to thermal shock, I commonly make a very quick visual observation when the temperature in the kiln is between 700°F and 900°F to determine if the glass has thermally shocked. If it has, then I turn off the kiln. This saves energy and allows me to keep some of the design components for other projects. The detail images of artwork shown here illustrate projects that have been heated through the brittle zone using the guidelines in this article. **GPO**



Bob Leatherbarrow, Blue Shield with tack fused design elements



Detail of blue wafers tack fused onto the base of cinnabar textured powders

Bob Leatherbarrow established Leatherbarrow Glass Studio in Calgary, Alberta, Canada, in 1988 and has created original kiln formed glass ever since. Known for his innovative styles, techniques, and designs,

he has taken an experimental approach to developing unique textures and color palettes using glass powders. His glass bowls and sculptures explore the subtle hues and delicate beauty of naturally occurring textures and encourage the viewer to ponder their origin.

In 2008 Leatherbarrow moved his studio to Salt Spring Island, British Columbia, where he continues to make glass and write e-books on his signature techniques. He has also been a popular instructor on both the national and international kiln formed glass scenes. Visit [www.leatherbarrowglass.com](http://www.leatherbarrowglass.com) to learn more about his work.





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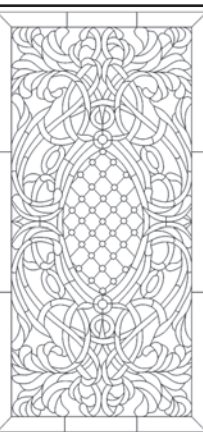
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# Dragon Design

## Creating with Liquid Glass Line

*Design, Fabrication, and Text by Richard La Londe*



In 1993, I developed the Liquid Glass Line technique in order to create an outline that could be filled in with colored frit. Many years later, I realized that this is similar to the wire-and-enamel technique used for cloisonné.

In the beginning, I used plastic squeeze bottles to apply the black lines, but I have since discovered that it's also possible to use decorating bags to draw the lines. We'll take a look at both, then finish by filling in the design with colored fine frit and powder.

*This tutorial is an advanced fusing project that requires a good knowledge about how kiln firing works and how glass behaves. To get started, you'll need to go to a ceramic supply store and purchase a one-pound bag of carboxy methyl cellulose (CMC). This product is used for ceramics and also, believe it or not, as a food additive. (Check the ingredients list for tortillas.)*



### **Bullseye Glass Co.**

6 mm 1100 Clear Tekta for Base Glass, 8" x 8"

08 Size Black Powder for Design Lines

08 Size Powder in Desired Colors for Filled in Areas

01 Size Black Powder for Design Lines

01 Size Fine Frit in Desired Colors for Filled in Areas

### **Tools and Materials**

Carboxy Methyl Cellulose (CMC) Squeeze Bottle

Wilton Decorating Bag Set (optional) Large Binder Clip

Plastic Cup or Other Container Glass Pint Jar

Wide-Mouth Glass Quart Jar Stir Rod with Handle

Small Paint Brush Flat-Bottomed Spoon

Straightened Paper Clip Folded Piece of Postcard

Razor Blade Ultra Fine Sharpie® Marker Paper Towels

NIOSH 90 Dust Mask Vacuum Pen Spray A

Foam Brush Light Table Glass Cleaner Rags

Paragon GL 24 Brick Kiln

## **Making the Liquid Glass Goop**

*Boil one pint of water and pour it into a small glass jar or other heat-proof container.*

1



*Add five heaping tablespoons of powdered CMC and stir for about thirty seconds.*

2



You will have to experiment with the amount of CMC, because it differs between manufacturers and comes as either granules or flakes. Mash the lumps, but don't worry about any chunks that don't seem to want to break down. After the mixture cools and sits, say overnight, it will be a clear gel, and the chunks should have dissolved.

As with a good cup of coffee, I prefer to make the mixture thicker rather than thinner. You can always thin it with water, but you can't make it thicker. If it's too thin, start over.

*Drizzle about 1/3 CMC goop to 2/3 size 08 glass powder into a squirt bottle and mix with a stir rod.*

3



The squeeze bottle should be 3 inches in diameter or less, since larger bottles are too hard to squeeze for this technique. Wrap a piece of paper around the bottle neck and withdraw the rod. That will keep the liquid glass in the squirt bottle. Some people prefer to premix in a jar, then put it in the bottle or a small pastry bag. You will have to stir it again occasionally, since the powder will separate over time. A round-shaft Phillips screwdriver makes a good stir rod.

*Trace the pattern lines onto the 6 mm 8" x 8" clear glass square.*

4



Working in reverse, place the 6 mm glass on the drawing that has been flipped over. Squeeze and touch the liquid glass container to the clear sheet, lift it up 1/2", and let the glass line drop into place. It should flow easily but not expand sideways. If that occurs, add more glass powder and stir again.



Energy Mandala, 2014





Experiment with the ratio of goop to powder to get the right proportions until you can lay a nice even, round line onto a piece of glass. A mixture that is too thin will flow and spread out, while a mixture that is too thick will be too hard to squeeze through the nozzle. You can use a straightened paper clip to clean out the tip of the nozzle if needed.

You can also achieve some nice effects by spreading this mixture with a palette knife or smearing it with a paint brush with a handle that has been sharpened on the end. Fusing the line to stick will produce a dimensional line. Of course, a full fuse will make it flat. Either way, the CMC burns off clean.

### The Decorating Bag Alternative

When I originally developed the liquid glass technique in 1993, I tried using an oil-cloth pastry bag. The goop and powdered glass got all over my hands, table, clothes, and everything, so I gave up. I found that a squirt bottle worked great and with less mess.

When I wrote my books, *Fused Glass Art and Technique* and *Vitreous Enamels and Other Techniques* in 2006 and 2009 I was using the squirt bottle, which could lay down a stiff line that stood on the glass like a piece of wet spaghetti. That was what I wanted so that I could fill in the areas with powdered glass. In 2011, however, when I was teaching a workshop in Austin, Texas, one of the participants had arthritis, which made it very hard to squeeze the bottle. It was suggested that I try a Wilton Decorating Bag, and when I was shown the new type of plastic bag, I readily adopted it. This device is much easier to squeeze and load. If I need a stiffer line, I reluctantly go back to the bottle. I hope this makes things easier for you too.

Here is a Wilton plastic decorating bag, plastic coupler, and metal tip. You can find these at hobby supply and cooking stores. I use a #2 tip and sometimes the slightly larger #3 tip.

5

*Prepare the decorating bag.*



Push the threaded part of the plastic coupler at the tapered end of the inside of the bag. Trim the plastic bag with a razor blade, leaving the threads inside the bag. Put the metal tip over the plastic coupler and screw the ring over the plastic part of the bag and onto the threads.

6

*Mix the black 08 size powdered glass frit with the CMC goop, this time in a plastic container.*



You can find the suggested ratios for the powdered glass and CMC goop above in step 3. Be sure to wear a NIOSH 90 dust mask that can handle silica dust.

7

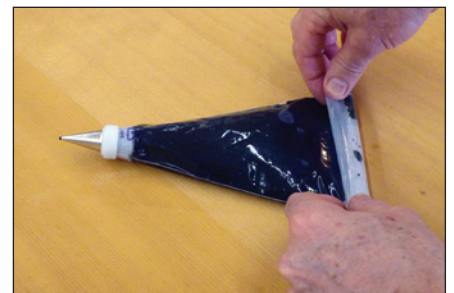
*Fill the decorating bag with the CMC/glass powder mixture.*



Place the decorating bag with the tip down in a wide-mouth quart jar and fold the bag over the edge. That will make it easy to scoop the glass goop mixture into the bag.

8

*Fold over the open end of the decorating bag several times.*



You need to put a decent amount of mixture in the bag to get it to work properly. Here I have folded over the end a few times.

9

*Fold over the edges and put a large binder clip on the end to hold it.*



You can keep the mixture in the bag for a couple of weeks. Just put a pushpin into the tip to plug the hole. If the goop separates from the glass powder, you might be able to massage it in the bag and get it to work. Otherwise, put it back into the bowl, mix, and reload the bag and put the mixture into a new bag.





10

*Trace the pattern lines onto the clear glass square.*



You just need to barely squeeze the bag to get the mixture to flow out. If it is too thin and the line spreads out on the glass, you need to squeeze the mixture back into the mixing bowl and add more glass powder. If it is too stiff, add more goop. If the line spreads, you can also quickly set it with a hair dryer. Clean the tip with water and a metal wire if it plugs up. Using a light box can help make it easier to see the pattern lines for tracing.

11

*Fill in the design areas between the black lines with your desired colors of powder and frit.*



Mix your desired colors of the size 01 fine frit with 08 powder in a 50/50 ratio, which makes a mixture that flows easily from the tapper. To make the tapper, I take a folded piece of postcard about 1-1/2" high x 4" long and tape one end closed. Place the frit mix in the postcard with a spoon and tap with your finger to allow a controlled and steady flow of the glass mixture. Be sure to wear a dust mask (NIOSH 90) that can handle silica dust.

12

*Clean up the spillover with a vacuum pen.*



13

*Tap the frit down with the back of a spoon.*



(Top to bottom) Mystic Messenger, 56" x 28", 1994, and Fuchsia Rim Mandala, 2013

You must apply at least 1/8" of frit, since it is about 50 percent air and fluffed up. That way, after the design full fuses, it is about 1/16" thick. Crushed glass frit is much less dense in color than glass enamels, and it takes more volume to cover an area. Place the light and transparent colors last.



14

Cover all of the previously applied frit with a 50/50 mix of size 01 frit and 08 powder.



Use white frit for a wall piece or clear for a bowl. This layer keeps all of the different colors from pulling up and leaving exposed areas. Tap it all down flat with the back of a spoon.

Fuse the frit so that it sticks to the glass but does not full fuse. Here is a suggested firing schedule, but remember that all kilns fire a little differently. You may need to adjust the schedule to fit your own kiln.

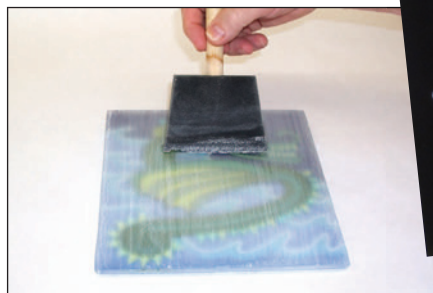
#### **Fuse to Stick Firing Schedule**

Segment 1: Ramp 225°F/hr to 1100°F and hold 1 min.  
Segment 2: Ramp 800°F/hr to 1310°F and hold 1 min.  
Segment 3: Ramp 9999 (AFAP\*) to 920°F and hold 1 hr.  
Segment 4: OFF.

\*as fast as possible

After the first firing, take the piece out of the kiln, flip it over, and clean the surface with glass cleaner and a rag.

15



In the past, I sandblasted this surface, but now I just apply a very thin layer of "Spray A" with a foam brush, which takes care of any extraneous junk picked up during the first firing. Spray A should be applied thinly enough to see through.

When the piece is clean, put it back into the kiln and full-fuse the glass using the suggested schedule below. Make any adjustments necessary to work with your own particular kiln.

#### **Full Fuse Flip Schedule**

Segment 1: Ramp 225°F/hr to 1100°F and hold 1 min.  
Segment 2: Ramp 800°F/hr to 1500°F and hold 1 min.  
Segment 3: Ramp 9999 (AFAP\*) to 920°F and hold 1 hr.  
Segment 4: OFF

\*as fast as possible

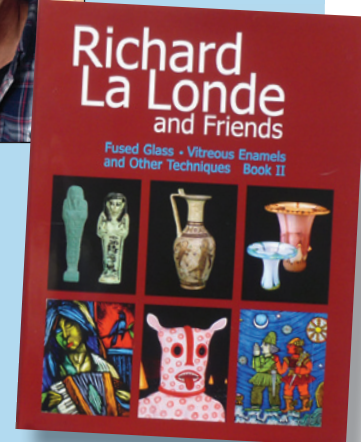
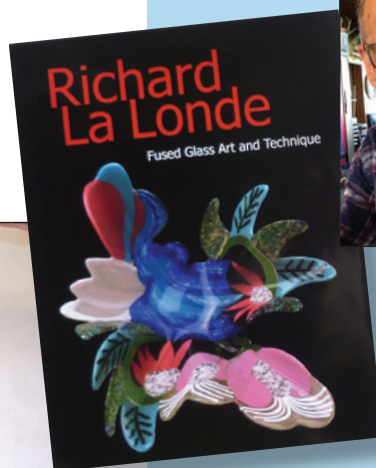
After this second firing, there will probably be a clear line around the tile, because the volume is a bit thicker than the magic 1/4". This can be prevented by placing a dam made from a sawed mullite kiln shelf around the tile, then grinding and polishing the edge, as you can see in the image of the finished dragon at the beginning of the tutorial.

Now that your own dragon project is complete, you can use the Liquid Glass Line skills you learned here to create many more unique projects. Don't be afraid to experiment with new designs, including the ones that come from your own imagination. **GPO**

## **An Opportunity to Learn from the Best**

Don't miss the chance to join master artist Richard La Londe on July 8, 2021, for a one-hour lecture, *Explore the Liquid Glass Line and Pictorial Frit Techniques*, part of the Master Glass Artisan Lecture Series™ from Glass Patterns Quarterly®. Richard will share three different frit techniques that use this style of line work and illustrate a variety of ways to add colored frit to create pictorial and patterned glass art.

Participants will have the opportunity to interact online with one of the pioneers of glass fusing and get answers to some of their more detailed questions about this advanced glass technique during the lecture. For more details, visit the "Glass Expert Webinars®" link under "What's New" at [www.glasspatterns.com](http://www.glasspatterns.com).



Richard La Londe has created art with glass since 1974 and fused glass since 1980. Museum collections include The Corning Museum of Glass in Corning, New York; Museum Boijmans-van Beunigen in Rotterdam, Netherlands; Notojima Glass Art Museum in Japan; and the Seattle Art Museum in Seattle, Washington. He has created 16 fused glass murals as public commissions, including the International Arrivals Gateway for the SeaTac Airport near Seattle, and has had his work presented in exhibitions that include 17 solo shows. The artist was also one of the original glass fusing instructors for Bullseye Glass Co., has taught at Pilchuck Glass School, and has given many glass fusing workshops throughout the United States, Canada, and Europe.

Richard has authored two books, Richard La Londe: Fused Glass Art and Technique and Richard La Londe and Friends: Fused Glass, Vitreous Enamels and Other Techniques Book 2. These volumes contain many examples of his Liquid Glass Line technique and aluminum wall mounting system for glass. They are available as hardback and e-books at [www.richardlalonge.com](http://www.richardlalonge.com).

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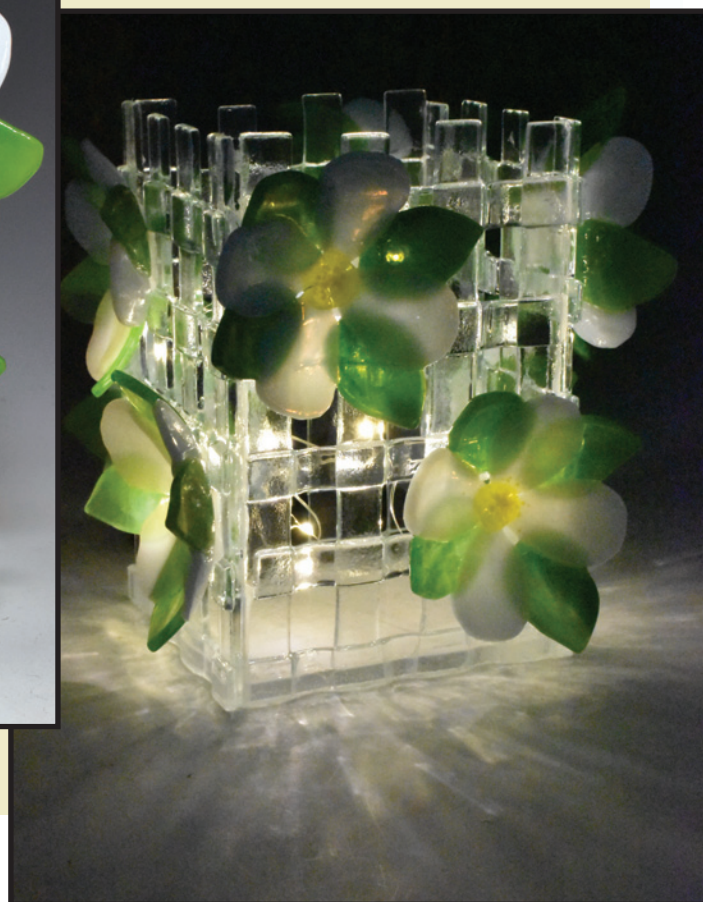
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# Dogwood Lantern

*Design, Fabrication, and Text by Lisa Vogt*



Lanterns are a wonderful way to introduce cozy light, enticing patterns, and stylish colors to any space. Now imagine having fused glass lanterns on display. Envision beautiful, airy pieces that reflect personal style and a deep appreciation for the beauty of original art.

I enjoy having fused glass lanterns in my home. These glowing accents add a peaceful, heartwarming ambiance to every room. Fused glass lanterns may be small, but don't underestimate their aura. They're powerful mood enhancers that radiate positive energy.

My love of flower gardening inspired this dogwood lantern design. I imagined a crisp, clean lattice with bright white blossoms. I'm pleased to say that every time I look at this lantern, it gently reminds me of the peacefulness I feel when I'm in my garden. Make this lantern, and you can create that comforting mood in your home too.

This dogwood lantern looks complicated, but it's actually fast and easy to make. It has eight flower and leaf clusters, two on each of the four sides. Yes, that's a lot of small pieces to cut, but stick with it. I promise you'll be delighted with the dazzling results when you're enjoying the warm glow of this lantern. Let's get started.

## **96 COE Fusible Glass**

Clear for Lattice and Lantern Bottom, 1 Sq. Ft.

White for Flowers, 1 Sq. Ft.

Fern Green/Clear for Leaves, 1/2 Sq. Ft.

Transparent Yellow for Flower Centers, 1/4 Sq. Ft.

Fine Opal Yellow Frit for Flower Center Detail

## **Additional Glass**

1/4"-Thick Clear Glass for Lantern Bottom, 1/4 Sq. Ft.

## **Tools and Materials**

Scissors Glue Stick Electrical Tape

5" Round Ceramic Slumping Molds

1"-Thick Stiff Styrofoam™

4 Kiln Posts 1/4 Sq. Ft. Wax Paper

Clear Silicone Caulk Adhesive

Candle or Battery-Operated LED Lights



## Making the Flowers and Lattice-Style Sides

1

Prepare the pattern pieces and apply them to the glass.



Copy the flower and leaf patterns and cut the pieces of the pattern apart with scissors. Glue the paper pattern pieces onto the appropriate glass color with a glue stick.

2

Use the pattern as a guide to cut the flowers and leaves out of the glass.



3

Grind the glass to remove any sharp edges and improve the shapes.



Clean the glass with water and dry the pieces with a towel.

4

Prepare the flower centers, then arrange the flower petals, centers, and leaves on the kiln shelf.



Cut 1/2" squares out of the transparent yellow glass and grind the squares to make a round center for each flower. Arrange the leaves on a primed or fiber paper covered kiln shelf. Stack the flower petals on top of the leaves and place a yellow center on each flower. For added detail, spoon fine opal yellow frit on each flower center. Brush off any excess frit.

5

Tack-fuse the assembled flowers using the suggested firing schedule at the end of the tutorial.



6

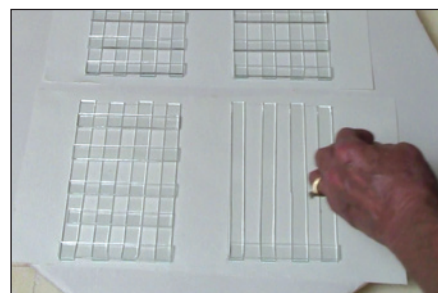
Place the tacked flowers on ceramic molds and slump them using the suggested firing schedule.



Now let's make the four lattice-style sides of the lantern.

7

Cut out the strips of clear glass for the lantern side using the pattern as a guide.



Use a pencil to draw rectangles the same size and shape as the lantern sides on a primed or fiber paper lined kiln shelf. Lay the long strips vertically on the shelf inside the pencil lines at even intervals. Stack the short strips on the long strips in a horizontal fashion.

8

Tack-fuse the glass strips using the suggested firing schedule.

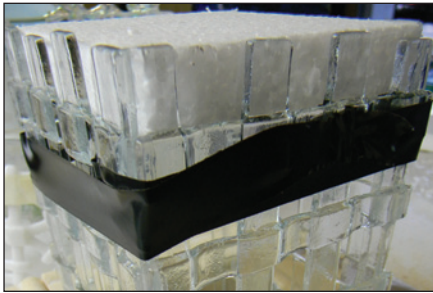




## Assembling the Lantern

9

*Assemble the lantern sides and glue them together.*



Grind one short side on each of the four lattice-style sides to make the edge flat and straight to ensure that the lantern will rest evenly on the table. Grind two long edges on only two of the four lattice-style sides. Grinding the edge flattens the glass, which gives it more surface area for the glue. It also gives the edge texture, which makes the glue stick better. This extra step improves the strength of the finished lantern.

Gluing the lantern together is a little tricky. You'll find a second set of hands very helpful. Stand the four lattice-style sides up on a piece of paper. Place the two pieces with the ground sides opposite each other. These sides will be glued inside between the two unground sides. Use a pencil to draw the inside bottom size and shape on the paper and remove the glass. Use the pencil line as a pattern to cut a bottom for the lantern out of clear 1/4"-thick glass. **Note that the bottom glass does not have to be cut from fusible glass.**

Arrange the sides around the cut bottom. Cut a piece of stiff 1"-thick Styrofoam to fit inside the lantern. Assemble the lantern on a piece of wax paper to keep it from sticking to the tabletop. Apply glue to the bottom inside edge of the four lantern sides and the two ground edges on the lantern sides. Press the glue-coated sides to the lantern bottom, one at a time. Press the glued sides together. Slide the cut foam inside the lantern to keep the sides upright while the glue dries.

Arrange the kiln posts or any other heavy prop around the base of the lantern. Wrap the top of the assembled lantern with electrical tape to secure. Wipe off any excess glue and let the glue dry overnight.

10

*Glue two flower and leaf clusters on each side, one side at a time.*



Lay the glued lantern on its side. Apply glue to the back of two flowers and place the flowers on the lattice. Let the glue dry overnight. Repeat until all eight flowers are glued in place.

Now light your creation with a candle or battery-operated LED lights and enjoy the uplifting mood your lantern brings to your home.

**GPQ**

## Firing Schedules

Note that all kilns fire differently. Test-fire these guides in your own kiln and adjust as needed.

### Tack-Fire Schedule

Segment 1: Ramp 300°F/hr to 1365°F and hold 10 min.

Segment 2: Ramp 9999 (AFAP\*) to 960°F and hold 40 min.

Segment 3: Cool to room temperature.

\*as fast as possible

### Slumping Schedule

Segment 1: Ramp 300°F/hr to 1265°F and hold 10 min.

Segment 2: Ramp 9999 (AFAP\*) to 960°F and hold 40 min.

Segment 3: Cool to room temperature.

\*as fast as possible



*Dogwood Lantern as seen in the Lumin-Essence Glass Fusing with Lisa Vogt video.*



*Lisa Vogt discovered glass while pursuing an education in fine art. For more than thirty-five years, this award-winning artist has drawn upon her fine arts background and own sense of style, drama, and whimsy to combine this historic medium with innovative glass techniques for limitless design possibilities. Her work has been on exhibit in major cities throughout the United States.*

*Lisa is the author of fourteen design books and a series of instructional videos in addition to frequent articles for industry magazines and fiction for publication. She also lectures at national and regional seminars and has been a featured artist on HGTV, PBS, and GPQ Glass Expert Webinars®.*

*A huge supporter of public art, Lisa regularly contributes artwork for auction to benefit local, regional, and national charities. Her home and studio are located north of Tampa Bay in Wesley Chapel, Florida, where she resides with her husband and two daughters. Visit [www.LisaJVogt.com](http://www.LisaJVogt.com) to find out more about her work and seminars.*

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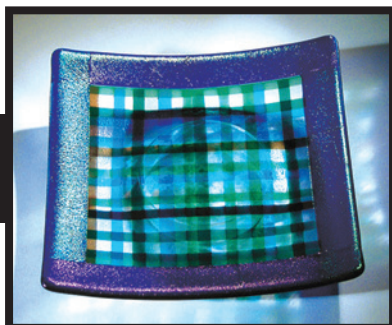
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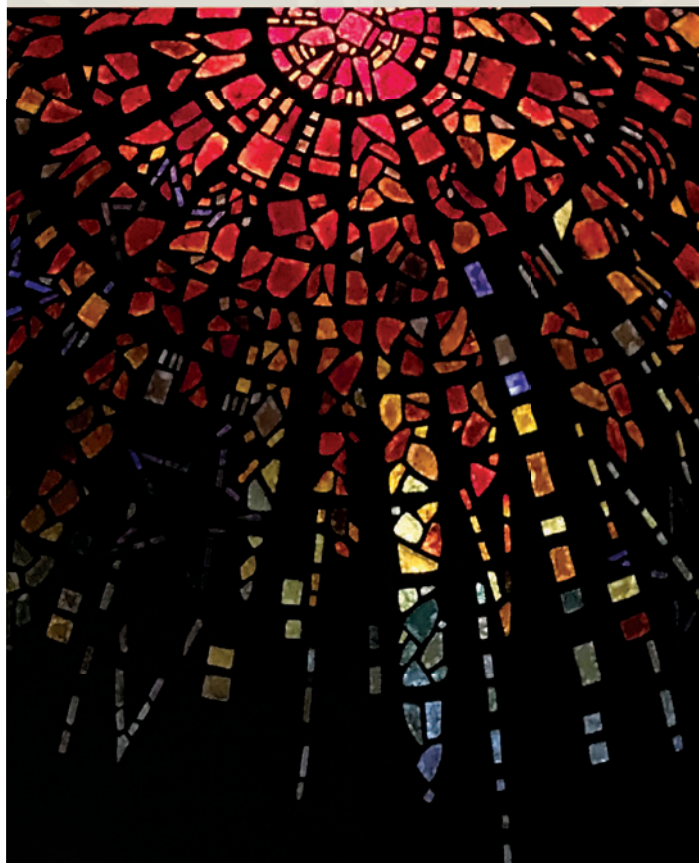
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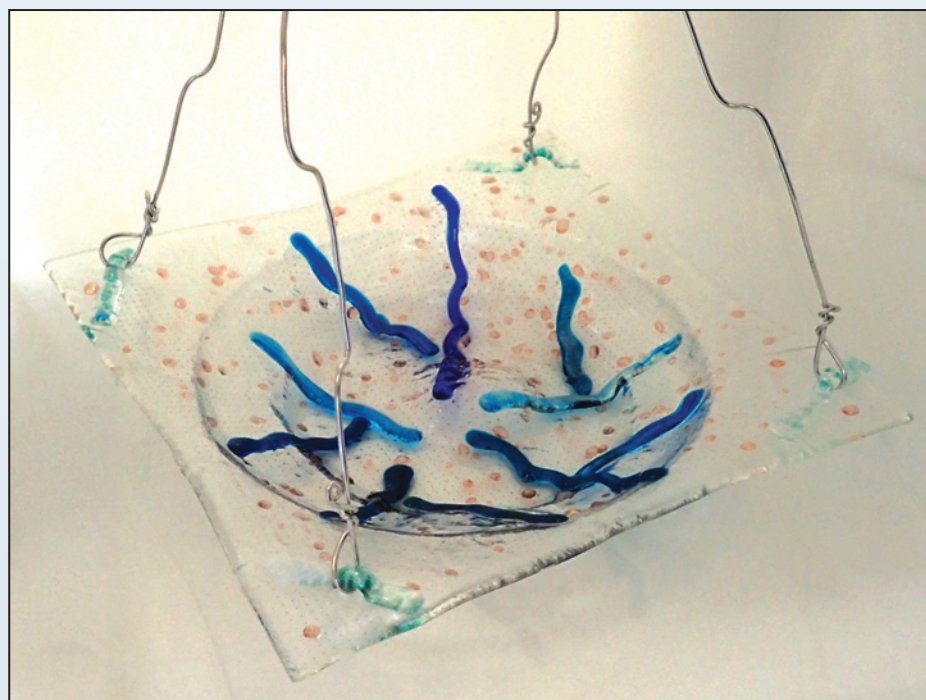
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# Pollinator Water Dish

*Design, Fabrication, and Text by Petra Kaiser*



Pollinators are important to the food chain, since they carry pollen from plant to plant helping them reproduce to bring us many of the fruits, vegetables, and nuts we enjoy. One of my students made me aware of the issue that bees and butterflies, our most important pollinators, also need water to survive, so we designed this pollinator dish.

Here are some important things to think about when you are making your pollinator bath.

- Bees need a safe water source, but they can drown in a bird bath.
- Bees are taking the water back to their hive to hydrate the ones who have to work at home.
- Do not add sugar to the water. We want to hydrate the bees, not feed them.
- Clean the water once a week and add a teaspoon of chlorine. This keeps the mosquitoes away and the smell attracts bees.
- Bees don't like dark colors and perceive red as black.

In this tutorial you will discover what it takes to make a pollinator water dish and which colors to choose to attract the bees. You'll also learn how to design an easy-care water dish and how to make it into a tree-hanging dish.

## **Wissmach Glass Co.**

Clear Aerolite 96 COE, 11" x 11" (2)

Blue 96 COE Strips

96-01 Clear Coarse Glass Frit

## **Tools and Materials**

Plum Colored Mica Powder, 1/8 Teaspoon

Kaiser Lee Board, 12" x 12" (2)

Kaiser Lee Board Shelf, 12" Square

Papyros® and ThinFire Paper

Aluminum Wire

# 1

*Set up  
your mold.*



Most images of bee water dishes suggest that you use pebbles or stones that are above the waterline so the bees can sit on them while collecting the water. This can make changing the water a bit time consuming, so we will make a dish with bumps fused into the dish instead.

I used two 12" x 12" x 1" pieces of Kaiser Lee Board (KLB), one with an 8" circle and the second one with a 6" circle, and set them on a 12" square KLB fiber shelf. That way, the bowl will have a nice depth to hold the water. Instead of pebbles, I added a few bumps with KLB sand, the stuff that's left over when you carve KLB. I keep it in a lidded container and use it in many ways. You don't need anything to hold it in place.

Now you can just take a piece of glass, place it on top, and decorate it, then fuse and shape it in one firing. Or you can follow along and learn how to create a few design elements.



2  
Cut several strips of blue glass for the design elements.



Color matters when you want to attract bees. Scientists believe the most likely colors to attract them are purple, violet, and blue, but you should avoid red and black colors.

First I cut several strips of blue glass about 4" to 5" long and 1/4" wide and prefired them on a piece of KLB that I carved with rivets.

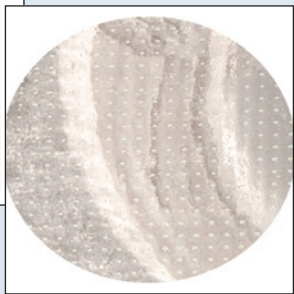
3  
Mix the clear coarse frit with a very tiny amount of plum colored mica powder.



This will add some pink/violet to the bee bath. The mica clings to the glass all by itself and results in a faint but pretty pink color. A third design element will happen in the next step.



4  
Create some bubbles in the glass for added detail.



Wissmach Glass Co. makes a textured glass called Aerolite. When you fuse the two 11" x 11" sheets of the glass by facing one sheet with the pattern side up and the other with the pattern side down then crisscrossing the pattern, you get tiny bubbles enclosed between the two layers.

5  
Prepare the glass hanging strips for all four corners of the textured glass square, then fire using the suggested schedule.



In order to hang the glass in the tree, roll up 4 pieces of Papyros Paper thick enough for the aluminum wire to fit through without tension. Then use a strip of glass and place it diagonally over the paper roll. Repeat this in all four corners before firing the glass.

This is a suggested schedule for firing to shape the strips and fuse together the Aerolite textured glass with the glass hanging strips. Remember that all kilns fire differently, so you may need to adjust it to fit your own kiln.

### Initial Firing Schedule

Segment 1: Ramp 600°F/hr to 1000°F and hold 10 min.  
Segment 2: Ramp 9999 (AFAP\*) to 1410°F and hold 10 min.  
Segment 3: Ramp 9999 (AFAP\*) to 900°F and hold 20 min.  
Segment 4: Off.

\*as fast as possible

6  
Add any desired decorations and fire again.



After the initial firing, leave the paper rolls in place and set the glass on the mold. In this case, I prefer a piece of ThinFire paper, since it works better with textures. Add your decorations and fire again to shape the glass and tack-fuse the strips and mica frit. Remember to adjust the firing schedule to fit your own kiln if necessary.

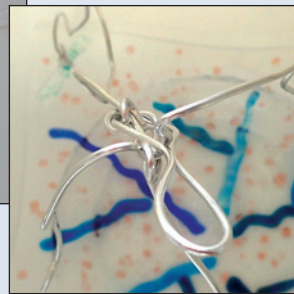
### Final Firing Schedule

Segment 1: Ramp 300°F/hr to 1000°F and hold 10 min.  
Segment 2: Ramp 9999 (AFAP\*) to 1370°F and hold 10 min.  
Segment 3: Ramp 9999 (AFAP\*) to 900°F and hold 20 min.  
Segment 4: Off.

\*as fast as possible



7  
Install the hanging wire.



I like working with aluminum wire, since it is easy to bend and very sturdy. I decided to use two pieces about 36" long and mounted them diagonally through the fused "holes." The wire also becomes sturdier with a few bends. Now that your bee bath is complete, all that is left is to add some water, find the perfect place to hang it in your yard, and enjoy the good feeling you will have knowing that you are helping our pollinator friends thrive.

GPQ

Visit [www.kaiserlee.com](http://www.kaiserlee.com) to find out more about Petra Kaiser and her stunning glass art and resources for creating fused glass art and working with Kaiser-Lee Board.

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# Mistakes to Avoid in Maintaining Your Glass Kiln, Part Two

by Arnold Howard

I maintain electric kilns in Texas. Most of the photos here are of maintenance errors I have seen during my visits to studios and schools. Kiln instruction manuals warn against these common errors.

- **Wires Damaged by the Element Connectors.** Wires should be kept away from the element connectors, which get hot enough to damage the insulation on wires. (Photo 1)
- **Element Grooves Damaged by Careless Installation.** If you ever change a heating element, use extreme care to avoid breaking the firebrick grooves. Take your time. If a friend helps you, arrange to work on the kiln when you both have plenty of time.

The photo is from a pottery kiln that I saw in a remote area of Texas. The bottom element had burned out, and the grooves were damaged during the repair. To remove an element, gently roll it back and forth between a thumb and forefinger until you work it out of the groove. (Photo 2)

- **Insulation Inside the Push-On Terminals.** Some kilns have a connection strip inside the switch box. When you press a push-on connector on the strip, hold the insulation away so that it doesn't work its way inside the push-on terminal. Insulation inside the terminal can cause premature failure of the terminal. When that happens, the terminal will blacken and stand out from the others.

The photo is from a new kiln. The customer purchased it from a school and hired me to convert it from 208 volt/3 phase to 240 volt/1 phase. (Photo 3)



(Photo 1) The insulation on the white wire was burned by contact with an element connector.



(Photo 2) Compare the bottom element grooves with the ones above. Notice how the bottom grooves have rounded edges and missing firebrick chunks. To avoid this, first remove the element pins, which are not always easy to find. Then roll the element out of the groove the same way you would roll a pencil in your fingers.

- **Kiln Wash on the Firebrick Walls.** This photo is from a small kiln near San Antonio. The entire inside had been coated with kiln wash, which is similar to glass separator. The kiln wash was even on the element coils.

Kiln wash, glass, glaze, and even sand can destroy elements. As a new employee at Paragon, one of the first things I learned while I was proofreading the instruction manuals was to keep contaminants away from the elements. (Photo 4)

- **Terminal Installed Only Part Way.** The push-on terminals must be pressed all the way onto the connections. This photo is of a push-on terminal that was pressed only halfway down. Other wires in the same kiln were so loose that they were easy to pull off. (Photo 5)

- **Kiln Vented with Foil Duct.** At one of the studios, a down draft vent had been connected to the kiln with a foil duct. During an inspection, the fire marshal asked me what I thought of the foil. I replied, "I think it should be replaced with an aluminum duct." He said, "I agree. I don't like that either." (Photo 6)

GPO



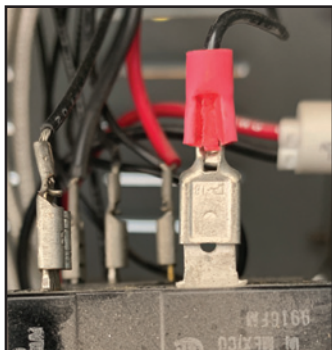
(Photo 3) Since the power strip shown here is near the insulation, you must be careful to keep the insulation out of the wire connectors. The first rule of kilns is that electrical connections must be tight and clean.





(Photo 4) I was called to repair the lock-in lid support on a small kiln, but the first thing I noticed was the kiln wash on the walls and element. When you brush kiln wash onto the firebrick bottom, protect the walls with a piece of cardboard. That prevents the kiln wash from splashing onto the walls and element grooves.

(Photo 5) Notice how the wire terminal is pushed only halfway onto the switch. This error is easy to make, because some of the switch boxes are cramped and difficult to reach inside. If that is the case, find a comfortable chair or stool, relax, and take your time. Pretend you are a surgeon and be careful with everything inside the switch box.



(Photo 6) Notice the foil duct that is attached to the Orton VentMaster. The down draft vent removes fumes from the kiln. I don't recommend a foil duct, because fumes from clay and paint can corrode it. On the plus side, however, notice the ample space between the kiln and nearby walls.

While Arnold Howard worked at Paragon Industries, he saw kiln controls evolve from switches to touch screen displays, tested the early glass kilns, and wrote instruction manuals. Arnold 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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