

**A COLLECTION OF
FREQUENTLY ASKED QUESTIONS
AND
HELPFUL HINTS
FROM
THE DAILY GRIND:
THE NEWSLETTER OF THE ASSOCIATION OF
STAINED GLASS LAMP ARTISTS**

**Compiled and edited
by Carol Conti**

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LIGHT TABLE

IMPORTANCE OF A LIGHT TABLE & CONSTRUCTION IDEAS

Paul Crist: A light table can be very useful in selecting the particular part of a sheet of glass to use, as well as seeing how all the glass pieces you have cut work together. The light table should be illuminated by light bulbs rather than fluorescent tubes, as incandescent light will be your ultimate light source. Incandescent light is somewhat warmer in color than either fluorescent light or daylight, so glass will appear different in each. We have found that the wattage necessary to properly illuminate glass on a light table is far greater than the wattage required to illuminate the lampshade when it's finished. 100 watts per square foot of light table surface is a good rule of thumb to follow. The glass covering the light table should be clear, because frosted glass will change the apparent opacity of your glass, as well as obscuring some subtler effects.

Carol Conti: In order to see how your glass will look when light is transmitted through it, I think a light table is absolutely necessary. Here is a very simple way to build one: place a piece of 1/4" clear plate glass (at least 18"x24") on top of four support bricks or blocks of wood (4"x4"x6"). These supports should be positioned at each corner of the plate glass. Attach a spring clamp light fixture to a corner block and illuminate it with a clear incandescent light bulb. If you decide to build or purchase a more substantial table, remember to ventilate it so that the build up of heat generated from the light bulbs can be eliminated. A dimmer switch is helpful to have in your light table. If you raise the back of the plate glass up at a 20 degree angle, you will be able to sit at the light table and not be bothered by the light bulbs.

Al Zimmerman: In a pinch, you could use a glass-top dining table with a lamp under it for your light table!

Mike Barnes: In addition to my light table, I have a large 1/4 inch x 40 inch diameter glass table top that I use to display my assembled pieces after they're cut. The table top sits on two saw horses with lights underneath. This provides me with an alternative method of selecting glass. I can hold a piece of glass under this table top and see how well it would work with the pieces that are already displayed.

Vic Seeted: I built my light box on dimensions that I thought I wanted and what would work for me. Mine is 52"x52". I rebated the edges an eighth of an inch for the quarter inch (beveled edge) plate glass to fit into. I installed lamp sockets into the sides. I added two moving pieces on the bottom - installed each with a lamp socket and connected them together. This allows me to light the entire project and to move the two bottom pieces around to see the interplay of light at different angles and different perspectives- just as your completed shade would look when it is lit.

Twyla Morgan: My grandson's Foosball (air hockey) game has made its way to my glass studio! As I was looking at it, I noticed all its similarities to my light box. If you could pick one up cheap at a garage sale, it would be easy to wire and then place glass on its top. The long rods are removable which would leave holes along the sides for wiring and ventilation.

Kevin Hendon: I am re-thinking my studio's light box and want to change it to

handle a full 360 degree layout for a pattern. What would be the minimum requirement for the box?

John Cannon: Take the pattern for the largest shade that you plan to build and lay it out on a flat surface. Mark the outer edges of the pattern. Move the pattern around to add the second repeat; mark these edges. Repeat until all the pattern repeats are marked. Measure the total width and length of the pattern repeats and add a few inches to both dimensions to give yourself some “working” room. Use double strength glass for your table.

Deb Bowen: My round light table is made of 1/4 inch tempered glass with a slightly beveled top edge. The table is 41 inches across and will accommodate most of the lamps that I build. A downside to having a larger sized light table is that, when working on smaller shades, you will need to lay black paper over the edges to keep the light from penetrating through to the unused parts of the table.

Peter Grotepass: We have three light tables in our studio; all of them are round and have diameters from 30 to 48 inches.

Chaz Smith: When I use a light table, I draw the pattern on the glass of the table and then draw a dotted line across where the bulbs will be. When I hold the glass over the table for selection, I put the bulb under the dotted line and then angle the glass over its appropriate place on the pattern.

Julie Stearns: I finally got a decent sized light table! I bought a used round coffee table that had a 30” glass top and wood bottom. My husband wired it and placed 4 light sockets in the bottom. He cut a sheet of white plastic ceiling light panel in half to go around the inside to keep in reflected light. We spent less than \$50 for everything!

Kevin Hendon: I want to share an amazing discovery that I place in the “DUH” category! I was fitting the 22” Tulip on the mold - a shade that has an amazing vertical apron that defies gravity. Thinking about my predicament of not having enough wax or how to defy gravity, I decided to rewax the last third and left the last glass easel on the light box. What a discovery...the light box warmed the pieces so, when I transferred them to the mold, they adhered to the wax and STAYED.

note: Kevin has one light table on which he selects glass, another table to hold finished repeats for comparison and another table is used to build repeats.

Vic Seested: I wonder if it made any difference if you used frosted glass instead of clear glass for the top of a light table or if you used frosted bulbs instead of clear bulbs to light the table.

Ichiro Tashiro: In my opinion it makes quite a difference. It even makes a difference in a lamp. Try using a clear light bulb and a frosted bulb in your lamp. Place the lamp in front of a white wall and see the difference each bulb makes on the wall.

Kevin Hendon quoted **Paul Crist:** The glass covering the light table should be clear because frosted glass will change the apparent opacity of your glass as well as obscuring some subtler effects.

LAMP SHADE CONSTRUCTION MOLDS

ODYSSEY LAMP SYSTEMS

The Odyssey System is an outgrowth of production methods used at Paul Crist Studios and is based on two features: a 360 degree "Full Form" mold (that permits assembly of the whole lamp at one time) and Tacky Wax, its patented adhesive that holds glass pieces in place. The mold is made of fiberglass and is virtually indestructible - allowing it to be used over and over again. Pattern lines are engraved into the mold. Tacky Wax allows you to put all of the glass on the mold at one time and gives you the freedom to cut, fit, foil and solder your lamp together in separate complete operations. Each Odyssey mold kit contains a fiberglass mold, one each of mylar and paper pattern sheets and an instruction manual. This Company sells exact replicas of Tiffany hardware, bases, crown & branch sets, filigree, jewels and turtlebacks. It also sells such things as Pattern Linen - used to draw your own designs, posters of Tiffany designs and color slides of Tiffany reproduction shades by Paul Crist Studios.

WORDEN SYSTEM

The patented WordenSystem™, introduced in 1974, uses economical styrofoam forms that are light in weight and easy to use. Removable MagicStrips™ allow you to construct a Worden lamp design on one form. Lamp designs ranging from Tiffany reproductions to original designs by Howard Worden are available and are built on SectionalForms™ or on 360 degree FullForm™ shapes. Several lamps can be made on each form by simply changing the MagicStrip™ guides. Glass pieces are positioned on the form and held in place with pins for soldering. The heavy paper MagicStrips™ protect the form from heat and solder. A lamp designing grid is available for those who wish to design their own lamp. The Worden Company sells accessories such as cast brass branches, spider legs, heat caps, filigree, jewels and turtlebacks. It also sells, among other things, LampLeveler™ position tools and Flex-Bar™ - tinned copper braid for reinforcing shades.

COMPARING WORDEN AND ODYSSEY METHODS OF CONSTRUCTION

Carol Conti: Odyssey bases their patterns on authentic designs of Tiffany. The patterns are made of mylar and the molds are made of fiberglass. These molds are full molds - no guessing about how to line up sections. In addition, the Odyssey instruction manual is a great help. When one of my students wants to use a Worden design, we buy all the sections that are necessary to make up a full mold. A plus for Odyssey is that Tacky Wax makes every part of construction so much easier. Wax is not a nuisance if you use just a tiny bit of it on the back of each piece of glass in order to hold it to the easel and then use the same wax to attach it to the mold. We even found out that by securely wrapping Worden molds with Saran Wrap, you can use wax to hold the glass pieces in place. After the outside is soldered you just lift the lamp off the mold with the Saran Wrap still attached.

Jo Anna Vitale: As far as Worden vs Odyssey....I have made both and I have taught with both and I still prefer the Odyssey for strength and ease of use and of course, authenticity. I must admit that I haven't used tacky wax but rather start at the top and "sweat solder" the first row to the brass ring. Then tack solder each

piece one at a time to each other going around and around until it's all done. I flip it over carefully and solder the inside while it rests inside a big box of crumpled newspaper. When that's done, I solder the outside. This seems to work for me.

NO OXIDATION WITH THIS METHOD OF CONSTRUCTING A LAMP

Nancy Pimental: This method of constructing a lamp is especially helpful for beginning students as well as those who cannot complete a lamp in a timely fashion. First of all, zerox your pattern onto full sheet Avery label paper, making as many copies as needed. The label paper cuts with pattern shears and stays on at the grinder. We cut around the pattern once it is on the glass, eliminating the need to trace. When we build a lamp, we tin each piece and wash it before soldering it to the lamp. Starting at the top, we only need a little duct tape to get us started...from there on out we tack solder the clean pieces on without flux. If it takes a week or two years to complete the lamp, it does not tarnish from flux. (After some of our students suffered from allergies, we discovered a safe flux...lemon juice. It works fine, but be warned that it might stain some glass, so try the juice on samples of the glass you plan to use.) If it sits a very long time, you may need to shine the solder with extra fine steel wool, but the lamp readily takes a bead with little or no oxidation. Our students prefer this method to using wax, since it is much cleaner.

GROUTING AN ODYSSEY MOLD

Paul Crist: Lines engraved into an Odyssey mold are permanent, but are difficult to see, so they need to be filled with colored grout to bring them out. Here is an alternative to Odyssey's "Mold Mud". Mix together 3 tsp. powdered tile grout (without sand), 1/2 tsp. powdered black tile grout pigment, 1/2 tsp. white glue and about 3 tsp. water. This mixture should have the consistency of pea soup.

ALTERNATIVES TO GROUTING LINES

Conrad Grobbelaar: Instead of using grout on my Odyssey mold, I decided to use a permanent transparent marker to "draw" the pattern on the mold. It was a fairly easy process, since the tip of the marker fit nicely into the engraved lines.

Nikki O'Neill: The lines on my mold are now darkened with an extra-fine black Sharpie. I actually enjoy this part - becoming familiar with the pattern and thinking about the glass shapes and colors.

Wayne Taylor: This time I darkened the lines on my mold using Joe Porcelli's technique. I bought some drawing charcoal from Wal-Mart. I wore gloves and rubbed the mold with the charcoal sticks. Then I used paper towels to remove the excess powdered charcoal that was on the mold. I think the whole process took 12 minutes!

ADD STABILITY TO AN ODYSSEY MOLD

Lynn Perry: Install a wooden base in the bottom of the mold for strength, dimensional stability and to aid in the lamp's assembly. To facilitate releasing a shade from its mold, drill six holes (less for smaller molds) about four to six inches from the center of the wooden base. The diameter of these holes must be large enough to insert 100 watt light bulbs. Heat from the bulbs will melt the wax so that the lamp can be lifted from the mold.

DRAW DIRECTIONAL GUIDELINES ONTO AN ODYSSEY MOLD

Sandy Stringfellow: After I discovered that the 14" Dragonfly mold had no directional arrows so that my unique glass would line up correctly, I built my own plumb line! After drilling a hole in the Odyssey mold to accommodate the pipe of the Worden Lamp Leveler, I looped nylon twine (20" long) around the pipe and tied a heavy object to the other end of the twine. Following this plumb line, I used a fine point black Sharpie and drew a line from the top of the mold to the bottom. I did this all the way around the mold. Where there were large pieces, I had to place the plumb line down the middle of the piece. After I cut my mylar pattern, I held each piece to its corresponding spot on the mold. By following the lines I had drawn on the mold, I marked a vertical arrow on each mylar pattern piece. In order to achieve some extra accuracy, I drew vertical lines to follow on my sheet of glass.

A HINT ABOUT USING WORDEN MOLDS

Walt Boepple: Order 2 sectional forms to construct your Worden pattern. Cut the glass for the first sectional form and then pin the second form up to the first one. Cut and fit to glass on the second form. You can then solder up the first section, but don't solder it to the second just yet. Remove the soldered glass section and lay it aside. Take the first form and put it over next to the second; it now becomes the third section. Since the edge of the first section and edge of the second fit perfectly, you can now solder the second section. Remove the second soldered section from its form and move this form over so that it will become section four - and so on. This way you make sure that no glass sticks out over the edge that will haunt you later. When you come around to do the sixth section, you fit it to the first section that you did. This is so simple and you get a perfect fit. When you shrink wrap a Worden mold the key is to get the Saran Wrap draped over the mold with quite a bit of excess so that you can wrap it up under the mold. Then, with any means you have, secure the wrap in place. I use "T" pins, straight pins, masking tape, duct tape and everything that I can to really get it up under there so it has something to pull on when it starts to tighten because of the heat. I did not have any need for gloves when I heated it over the (stove) burner. Just raise it up from the burner and you will see it start to tighten as soon as the heat hits it.

PROTECTING STYROFOAM MOLDS

Al Morgan: For many years I've been making lamps using Worden's molds and patterns. When I receive my styrofoam mold, I cover it completely with G.E.'s clear silicon sealant - using my fingers to rub it into the mold. The next day, I pin the pattern strips to the mold and again rub the clear sealant onto the mold - covering the pattern and spaces between. I solder my shades while they are on the mold. Since using this method to preserve the mold, I've been able to make five shades with the same mold.

Arthur Haft: I've only made lamps using Worden forms and found that if you cover your styrofoam mold in clear silicone caulking, solder will not melt through the form...it just rolls off.

Carol Conti: If the Worden design you want is not available on a full form, buy enough sections to make a full mold. Glue the sections together with Elmer's

glue. After the glue is dry, attach the "Magic Strips" to your full form. Cover the full form with masking tape to help protect it from solder. (The pattern lines are still visible.) Wrap the form securely with Saran Wrap and tape it tightly to both the top and bottom of the form with masking tape. No need for pins! Use Tacky Wax to hold the glass pieces to the Saran Wrap.

After soldering the outside of the shade, remove the masking tape that holds the Saran Wrap in place and then lift the Saran Wrap and soldered lamp off the form. The Saran Wrap pulls away easily from the shade so that you can solder the inside of the shade. (Since heat isn't necessary to release, the wax doesn't melt so it's easy to remove the lamp without damaging the inside foil.)

Donna Darcy: The first thing we encourage students to do is to cover a styrofoam mold with clear contact paper and then use spray adhesive to glue the pattern to the mold. After that is done, we have them cover the pattern with clear contact paper. Then we coat the mold with Tacky Wax so that we can eliminate the need for pins. The shade is removed from the mold in the same way you would release a shade from an Odyssey mold.

CHOOSING GLASS

MAKING GLASS CHOICES

SB Anthony: The first thing to look for in making glass choices is to find glass that is specially made for Tiffany reproduction lamps, such as Youghioghney, Oceana, Uroboros, Chicago Art Glass, Lins and Bullseye. Then, think of watercolors. Consider how the color is not at all flat, but varies in depth and intensity. Then think about a garden and how it really looks in the sunshine/filtered shade. Avoid the temptation to think in flat colors, like you find in a poster. Very few flowers present themselves flat - with open petals. They curve, are partially hidden, bent over themselves; sometimes they fold or lay sideways. Some petals shade other petals. A surprise splotch of light might appear. Color reflects from petal to leaf and leaf to petal. The background may not only be "sky", but might contain a blurred vision of distant flowers, sunshine, leaves and earth. To strive for this representation in a lamp is referred to as "color bleeding".

Paul Crist: Choose glass you love...don't start a lamp with predetermined color ideas. Use ring mottles for the sparkle...that's why it is an important glass. Strive for disharmony in a geometric background such as is in the 15" Spider. There is danger trying to exactly copy the glass we see in photos of Tiffany lamps since the photographed glass tends to look more opaque and photos don't do justice to the translucence of the real thing. Leave some parts indefinite in your lamp so there is room for the viewer to use his imagination. (Is it a flower petal or a leaf?!) Search for and occasionally use the transparency found in Stipple glass. Chipped, chunk glass makes nice flower centers. The natural form of the Peacock lamp calls for streaky glass for the feathers. Sculpt the layers of feathers with shading to achieve a dimensional look. Use color bleeding extensively: in other words, contaminate one color with another and never make flowers all one color. Choose your glass for the depth, richness and complexity it exhibits as well as its color.

Peter Grotepass: When selecting glass for a lamp, I put the glasses side by side onto my light table, (it is approx. 25" X 35") and switch on all the lights. What I want to control by doing that is the color harmony of the different glasses, (for flowers, for background, for leaves, for the border, etc). I keep my eye on color relationships among the glasses. For example: if I want to make a Poppy with red flowers, I have to select a background glass with a little bit of red in it, and I have to look for glass for leaves with some hints of red in it, and a border, where there is a little bit of red in it.....and so on. Of course I do not use a red background glass, and I do not select red glass for leaves, but- you know, there has to be a little bit of red in the glasses beside their main characteristic color, which could be, for example, a kind of transparent blue for the background and green (probably with turquoise) for the leaves in this case. The appearance of the glass when the lamp is unlit is unimportant to me.

Carol Conti: Choosing glass for the Waterlily is fun to do. One way of cutting flowers is to cut out one flower and, if you are temporarily satisfied with it, move on to the next flower. If you're not happy with parts of that first flower, you might be able to use it in another easel (at least that's what I tell myself!) You could

also cut all the flowers for one easel out of "similar"(but not identical) glass - say very pale pinks then cut the flowers of the second easel from medium pinks and the third easel flowers out of darker pinks. Lay the three easels on your light table and start "flower arranging"! You might decide to leave the darker pinks in one area and work out - from each side of this area with lighter flowers, or you might move them around so you have a variety of flower colors throughout your lamp. After you are satisfied with your arrangement, you can start on the background and try to blend the colors in your background around the specific flower that you've set in place. The lily pads and leaves should reflect the "feeling" of the flowers and the background that are in their area. The critical border row is always the last thing I deal with. When the "body" of the lamp is completed, it seems to be so much easier to decide on which glass will tie the lamp together and not compete with it.

“BLEEDING” (COLOR CROSS REFERENCING) COLORS

Nikki O’Neill: “Bleeding” is using a color in a different element of the lamp than where you would logically expect it to be. Examples would be to show some pink or red on a green leaf, or use glass that shows a few green streaks on flower petals. Thus the petal references the green color and vice versa. Not only does this look more real, but these spots of color catch the eye and keep it moving around the lamp. This is another way to get away from “paint by numbers” where roses are red, leaves are green and the background is blue. Another example might be to use a little amber in a leaf or jewel if that color is also being used in a border row. Tiffany was a master of color - using this technique extensively.

Andrea King: Nature is our best teacher when studying the reflection of light and its relation to colour...you only have to look around your garden to see how the colour of blooms seem to wash or bleed into the background causing it to become a “hazy” sort of scene.

Joyce Mattson: Good examples of “color bleeding” can be found in paintings by the masters when you find unexpected but totally gratifying hints of color that are repeated in different areas and subjects of a painting.

Paul Crist: In “color bleeding” we try to enhance a natural scene by harmonious use of light and shadow in our glass. Remember that a color affects the colors that surround it. an example would be to choose a flower color and have that color reflect in the background glass.

CHOOSING BACKGROUNDS

- Balance. The color intensity of glass used in flowers should duplicate the intensity of leaves, borders and background.
- Bleeding (cross-referencing). Background glass should pick up some colors found in flowers and leaves. The aim is to make this appear to be a reflection.
- A streaky background, showing colors that are found in blossoms and leaves, will add contrast but will still blend in with the blossoms and leaves.
- A bold background can be used to define “strong” flowers and leaves. Such a sharp contrast also allows similarly colored flowers to stand apart from each other...a beautiful battle of colors - with no winners or losers! *An example of this contrast can be seen in the “Wisteria Laburnum” shade by Penny Chamberlain (April, 2005 calendar).*

- Flower petals or leaves can become background. Background pieces can become petals or leaves.
- Use a lighter background color to surround light colored buds; background can be deeper around more deeply colored mature flowers.
- Highlights of color in some areas of the background glass can give the impression of other plants in your landscape. In fractured glass, the colored flakes can mimic bits of sky, grass or flowers.
- For a floral design, try fading to lighter hues of the glass as you move from the bottom of the shade to its upper section. The background of waterlilies and fish is water, so the background can become more intense as you move up toward to the aperture. The background for dragonflies can either be interpreted as water or sky so fade up or fade down....or possibly make the central section of the design more pronounced by employing the dominant areas of your background glass at the center.
- As long as the glass you are using for the background is essentially the same color, try a combination of textures - mottles, ripples and/or fractured glass. *An example can be seen in the "Flowering Lotus" by John Melz (January, 2005 calendar)* When John submitted the photo of this shade to us for calendar consideration, he wrote "Many times when we see reproductions of this shade, the bottom irregular rim has been crafted of glass that was entirely too dense for the lower section of petals. Because of the angle of the rim, coupled with dense glass, the rim usually "goes dead" when lighted. I eliminated this negative aspect by using very translucent - and highly opalescent glass at the bottom. It catches and transmits light quite beautifully. The upper purple background is Youghioghney, but the purple below and between the flowers is Bullseye ripple - with the same value of purple, but with the addition of other subtle colors. Additional texture gives an extra" movement to the overall composition.

Bonnie Eckert considers **Scott Riggs** from Huntington Beach, California, to be one of the most talented artists in our time. She contacted Scott and asked for some comments about backgrounds. Here is his reply: "I really put a great deal of thought into my lamp backgrounds today, but we have to use the glass that we have or can get. If we tried to do color bleeding on every piece, we would all have to be glass suppliers and go into the business of making glass. Lately, I have been trying to get a flow in my backgrounds by strip cutting - like on the gridwork of the Pansy I've just completed. This was my most challenging background so far. The real trick in backgrounds is to get a great fade in a geometric shade with the flow of glass going horizontal. I just do not like the checkerboard look in a geometric. Sometimes I will strip cut a geometric vertically, then arrange the long pieces together so that they are similar to the ones next to them. Then I separate the pieces and keep it all in order. It seems my taste in shades changes constantly and I love the different challenging aspects of each and every one that I do. To me, there is just something very pleasing to my eye when I see a fade or transition in any background. I keep trying to pull it off."

Nikki O'Neill: I've come to think that the background really sets the whole mood of a lamp. I remember seeing a Tiffany Poppy during a visit to Nemaquin

Woodlands. This particular Poppy is very special in its overall impression of the whole color scheme and the way the background works with the foreground. This lamp has been in my head ever since! The background was a mottled light gray color which made the poppies pop. It didn't fight with the foreground elements, but complemented them very well - leaving a very "clean" look.

FINDING FLOWERS IN GLASS

Peter Grotepass: I look for the flowers in the glass as it lays on my light table. When I find an area in the glass that "shows" me a flower, I put my transparent windows over the area and draw all the petals of this particular flower. It seems there is much imagination used as I build a flower. I try to make some flowers seem dense inside and transparent on the outside. To develop an eye for this, begin by laying out a flower that is simply dark on the inside and lighter on the outside.

ART GLASS & LIGHTING A SHADE

Tiffany lamps were meant to be lit so that the art glass that was used could be fully admired. An exception would be the dichroic glass that Tiffany specifically produced. A lamp using this glass could be appreciated by being lit or unlit.

IRIDESCENT GLASS

Joe Porcelli: Take care if you are using an iridescent glass. This glass could cloud because of a reaction between the metals in the glass and the chemicals in the flux and patina. If clouding is present, try spraying the lamp with a light coat of high quality satin finish lacquer. (First, test it on a piece of scrap glass.)

TEXTURED GLASS

By running the texture of rippled glass lengthwise (horizontally) on a border, you can reduce the harshness of a geometric edge.

If more sparkle is your goal, use the rippled surface on the outside.

The rough textured side of fractured glass should be turned inward.

Shauna Palmer: A great friend of mine suggested that by reversing textured glass pieces you can create interest and dimension and add a feeling of life and activity to your glass work. In my latest work, I reversed glass in some of the flowers to emphasize the petals and make them more realistic. This is a great way to get two coordinated looks from one sheet of glass.

Barb Grollo: As to the question of texture "in" or texture "out", I find it really depends on what I'm trying to achieve. I tend to use it out, mostly because the "back" of the glass often looks irregularly mixed, and doesn't lend itself to being too visible. Of course, it depends on the glass. If I'm looking for a glass for a mountain range, I prefer the unmixed quality. Sometimes for water, using the ripple on the inside, gives more depth to the water and the feeling of movement and currents. I think it depends on the project and the glass.

Walt Boepple: The reason to use the granite (textured) side on the inside is to refract the light, to send it in all different directions as the light comes through.

Jo Anna Vitale: An ongoing discussion in my studio concerns texture up vs texture down. One of my employees always lays it down, while I decide based on the glass, on the individual piece and what artistic mood I'm in. But, for the most part I use the texture up; this applies to ripples, seedies, noogies, ice and granites. With Bullseye glass, I might use the "shiny" side for flowers but flip it to

the backside for the part of the flower that turns out. I use a lot of Bullseye green for leaves and sometimes use the "back" in front because it feels and looks like leathery leaves. I generally use Uroborus textures up because they are so beautiful and Youghiogheny, well once again, it depends on my mood!

“HOT SPOTS”

Carol Conti: Large transparent areas that are sometimes found in a sheet of glass are referred to as “hot spots”. If used in a lamp, these areas are without any color and would allow the glare of the light bulb to show through the lampshade. This can become a problem if we are reproducing a pattern with large pieces - such as in the peony design, but hot spots would not be a concern with a pattern like the wisteria, since random hot spots would add some wonderful sparkle to the lamp. (One of the reasons we use mottled glass in our lamps is because of its tiny hot spots that tend to mimic the sun’s reflections on a flower petal.) Along the edges of some sheets of glass there may be an abundance of hot and unusable areas that give no indication of color. Gradually though, the color that we are seeking starts to appear - working its way into the sheet until the distinctive colors take over. Many times there is a lot of waste in such a sheet of glass, so, in order to salvage more of the sheet to use in a lamp, we might try to sandblast or etch those parts where the color is gradually entering the scene.

Don Hughes: Rather than sandblast a whole sheet of glass that contains a predominance of hot spots, it is better to cut the glass pieces first and then sandblast the cut pieces. Number the pieces that need to be sandblasted, turn these pieces upside down, attach them with Tacky Wax to a wooden board and then do the sandblasting. This saves wear and tear on cutting tools - especially if you are trying to cut on the blasted side of the sheet.

Lynne Salcetti: Many special effects that I’ve achieved in my lampmaking have been arrived at by trial and error. For instance, I’ve tried different methods to help tone down “hot spots” in the glass. One product that I’ve used with success is Armour Etch which helped obscure some hot spots in a sheet of glass. I’ve also used it on the bottom of glass globes to soften the look of the color. The results were so good that I was able to use the globes as flower centers in a daisy lamp. I’ve also plated glass by soldering a second piece of glass under the first. I did this when I wanted to save the jewel tones of antique glass, but didn’t want the glare of the light bulb showing through. I plated the antique glass with clear cracked ice glass so that it ended up with a two dimensional look...a very interesting effect! On my last lamp, I sandblasted the backside of an entire sheet with mixed results. You couldn’t see through to the light bulb, but the shadow of the bulb wasn’t really dispersed enough. In reality, sandblasting produces a deeper version of what the etching cream can do.

Nikki O’Neill: A technique to use on small glass pieces to obscure their hot spots is to grind the backside. I made some little dragonfly eyes out of green cathedral glass to use in my last lamp, but they turned out looking too much like beady eyes that followed you around the room! My solution was to use a disk grinder with a 360 grit disk and hold the back of each eye on it for just a second or two. The result was a softer look...actually a more realistic look and the grinding also

allowed me to even out the thickness of the glass eyes. We shouldn't try to obscure all hot spots in our glass, though. Many authentic Tiffany lamps have an abundance of hot spots. The glass he used was so variable and organic - sort of like dappled sunlight and reflections.

Joan Luckhurst: Sandblasting the back of some "hot" pieces of Uroboros in the background of my Cobweb lamp seemed to help diffuse the light and increase the sparkle and color.

VARIATION IN GLASS THICKNESS

Vic Seested: I'm putting the finishing touches on a dogwood using Lins and Schlitz glass. The thickness of the different sheets of flower glass varies from 1/16th inch to 1/4th inch. Having such a difference in thickness of pieces next to each other presents an interesting choice ...do I build up the thinner pieces to match the height of the thicker pieces (using balls of wax) or should I solder the lamp, holding out the thicker pieces to sink into the shade after it is off the mold?

Lynne Salcetti: I'd let the flower petals stick up to emphasize the high relief and shadows they would cast. No one ever said that a lamp's surface has to be smooth.

Mike Barnes: I would leave the thicker pieces sticking up. In one of my lamps I used drapery glass for the flowers and had pieces that curved out from the plane of the lamp's surface. After seeing Tiffany's Magnolia windows at the Morse Gallery, I even left some tops of the rounded edges of my flower petals unfoiled.

Mary Ritter: I think it adds a lot of interest to have different thicknesses of glass. My rule of thumb, though, is that I don't want thinner cuts of glass overlapping thicker pieces. If, for example, I have a blossom made of thin glass that should appear to be overlapping a leaf of thicker glass, I would want to lift the blossom higher than the leaf because the blossom is more in the foreground. Maybe you could think of it in terms of layering from foreground through middle ground to background. Blossom pieces toward the front should be higher than the middle leaf pieces and the background should be set back furthest of all, i.e., flat on the mold. This will result in more of a three dimensional shade.

GLASS TERMINOLOGY

Nikki O'Neill: The wave of new glass has led to an interesting new vocabulary. "Hot" glass - i.e. furnace work, has been around awhile, most notably glass from Murano. Recently "warm" glass - i.e. kiln-formed glass has become the rage; probably because you don't need a furnace and it's more versatile than being limited to working at the end of a pontil (punty). It's warm glass that is just beginning to be accepted as art by galleries and collectors. Another interesting term is cold fusion - i.e. glues of all sorts. It seems we lamp-makers do another kind of cold working - foiled or leaded. Then there's flame-working, which used to be called lamp-working.

PATTERN PREPARATION BY CAROL CONTI

***“windows”:**

In order to find flowers, leaves and background in sheets of glass, “windows” help us focus on specifics in the glass.

1. Make as many paper copies as there are repeats of the original paper lamp pattern.
2. Use a precision knife and cut away all the flowers that are on one of the copies you had made.
3. On another copy, cut away all the leaves.
4. On the remaining copy, cut away all the background pieces.
5. Spray these copies with black paint in order to eliminate the white of the pattern and the distracting lines that are left.

***Use “windows” to purchase glass:**

Take your windows to your glass store. Place one of the sheets of glass that you may use in your lamp on an illuminated light table. If you are deciding on a possible “flower” glass, lay your flower window over the sheet and slowly move it around. You will “discover” a flower! (Try this on several different sheets until you are satisfied before making a purchase.) Repeat these steps using your windows to help you choose glass for your leaves and background.

***Use “windows” to lay out your pattern:**

Place the sheet of “flower” glass that you have purchased on your illuminated light table. Use the “flower window” as a guide when you draw *approximate* outlines of your flowers onto the glass with a Sharpie marking pen. (Mark the corresponding number from a reference copy onto the glass flower outline, so there will be less of a problem laying out the mylar pattern pieces onto the glass later on.) Don’t feel that you have to stay at one area for a specific flower, but take advantage of the window when there is some obvious coloring, movement or shading that you want to use. After your flowers have been outlined, proceed to the other sheets of glass and, with your other windows, repeat the procedure.

***special background considerations:**

With some lamp backgrounds, you find that you can *skip around* on the glass and get away with drawing your pattern pieces out randomly. However, on some of Tiffany’s designs, the background must be laid out in a consistent manner so that the movements, textures and colors of in the glass flow behind the leaves and flowers.

***remedy for potential cutting problems:**

If you find that some of the outlines you have drawn will pose cutting problems, erase the outlines with denatured alcohol and then spread them out so that you will be able to cut around the outlines and still be true to what the windows showed you.

***“holding copies”:**

“Holding copies” take care of storing mylar pattern pieces and is more efficient than keeping the pieces in envelopes.

- I. Make three more copies of the original paper pattern to hold the mylar pattern pieces. (One of these copies will hold the mylar leaves, another the mylar flowers and the last will hold the mylar background pieces.)

2. Cover these holding copies with clear contact paper. (The contact paper will protect the design lines, letters or numbers on the holding copy so they won't be damaged by the glue.)
3. As you cut out your mylar pattern, use a glue stick to attach each pattern piece to its proper place on the holding copy. (It's easier to find pattern pieces if they are separated by having the flowers on one copy and the leaves and background pieces on their own holding copies.)
4. Later, after you have cut and ground the first glass repeat, you will reattach the pattern pieces to their proper places on the holding copies, so that the patterns will be ready for the next repeat.

***reference copies:**

Make paper copies of the original paper pattern for reference copies. Have as many photo copies made as there are repeats of the design.

***glass easels:**

An easel is simply a piece of double-strength clear glass cut to the size of your paper reference copies. (Sand the edges of this glass to protect your hands from being cut.) These glass easels are placed over the reference copies on your worktable. Later on, as you construct your lamp, you will use a tiny ball of Odyssey's Tacky Wax to attach the prepared glass piece to the glass easels above its corresponding place shown on the reference copy. The glass easel can be lifted from the reference copy and placed on an illuminated light table at any time. This procedure makes it possible for you to continually examine your lamp as it develops and allows you to make any needed changes. This procedure makes it possible for you to examine your lamp and make any changes as it is developing. The easel also takes care of storing your developing project and eliminates the possibility of misplacing a piece. As each pattern piece is removed from its glass, it should be dried and returned to the holding set, since it will be used again for the next repeat.

***laying out the mylar pattern:**

Use a glue stick to attach the mylar pattern pieces to the corresponding outlines you have drawn on the sheet of glass. The glue stick works well by holding the mylar to the glass if you allow sufficient time for it to dry. After each glass piece is ground, dried off and attached with a bit of wax to its place on the easel, the pattern piece should also be dried and reattached to the holding copy using a glue stick. Now the pattern is ready for the next repeats.

***follow the pattern - not the mold:**

All glass should be cut to match the shape outlined on the mylar pattern and your reference sheet. Don't cut to match the shapes on the mold...the mold's lines are only used to approximate the position of the glass pieces. They do not define their exact contour or placement.

***final look at the easels:**

When you've completed cutting out your lamp and making changes as you go, the easels should be laid on the light table in the order in which they will be placed on the mold. Now you must make your final selections. Check to see if any section is distracting; too light or transparent, too dark or opaque causing a dead area or too streaky or the streaks are running the wrong way causing a

disruption in the continuity of your lamp. Lay the left side of the first easel on the right side of the last easel to check on flow and compatibility, since these sides will also be joined together.

HINTS ON PATTERN PREPARATION

COLOR PAPER PATTERNS

Paul Crist: It's a good idea to color your paper pattern with colored pencils so, when cutting your glass, you can quickly identify what all the shapes represent. Before coloring, take some time to study the pattern and decide how all the shapes would appear in real life. Use this mental picture of what you are trying to represent and use the qualities of the glass to make that picture come alive in your lamp.

ANOTHER WAY TO REMOVE OUTLINES

Lynn Perry: Sometimes the easiest way to remove numbers and pattern outlines made by a marking pen on the glass is with a pencil eraser. Be careful, though since some Bullseye glass can be permanently stained by the ink of a marking pen. Sometimes it can be removed by whiting compound.

CUTTING OUT "WINDOWS"

Mike Barnes: To those of you who use the "windows" method to choose glass, you will be able to cut out the pattern pieces (that you've covered with clear contact paper) more smoothly and easily if you put a piece of regular window glass under the pattern and use an X-acto knife to make your cuts.

Bobby Pedersen: To reinforce "windows" so they will stand up better to all the use they get, place Contact paper on the backside of the photo copy of the pattern before cutting and spraying with black paint.

Joan Bengtson: Instead of spraying the back of the "window" with black spray paint, cover the backside of the copy with black Contac® paper before you cut the "window".

Bill Callow: I use Carol's "windows and easels" technique to build lamps, but have clear mylar transparencies made of all repeats of the pattern. Clear copies are glued to the backside of the easels so I don't need to use reference copies.

Lynn Perry: When using clear Contact paper (or any plastic material that comes on a roll), apply the protectant to both sides of the pattern in the same direction. If the protectant is only applied to one side, the pattern will curl rather than lay flat.

Mike Barnes: **Peter Grotepass** uses a specially cut black background to view and assemble his cut glass pieces on his light table. This special background is quite expensive, so I used a modified approach. I took a sheet of black poster board - whose size completely covered my light table - and cut a hole in it that followed the perimeter of my pattern repeat. I assembled my cut out glass pieces on the clear piece of window glass (easel) and placed the easel on the light table. I then put the cut out poster board over the assembled glass pieces. This gave me a more concentrated view by obscuring the surrounding light source."

Larry Cartales: I have done something similar...a take off from Carol's "windows method"...use a full size pattern cut out painted black to cover the white paper!

MASTIC INSTEAD OF GLUE STICK

Doug Hohenstein uses latex mastic instead of a glue stick to hold the mylar pattern pieces to the glass. After applying the patterns to the glass with mastic, let them set up for a few hours. With this adhesive, there is no possibility that the mylar will slip away from the glass when you grind. After grinding the pieces, place them in a bowl of water and soon the patterns will easily slip away from the

glass - ready to be used for the next repeat. This product can be purchased from a hardware store that sells multipurpose ceramic floor and wall tile latex mastic.

REDUCE A PATTERN - CUT ONCE!

Eric Scott appeared on his sister's show (Martha Stewart) and demonstrated preparation and assembly of the Fish pattern for our Quilt. He has developed a method designed to eliminate a great deal of prep work. His method: make a copy of the pattern, reduce it in size by 3 - 5%. Copy the reduced pattern onto Strip-Tac Plus® or Crack & Peel®. (These products are heavy-weight adhesive-back label paper, available in sizes up to 28" x 35".) Now the pattern pieces can be cut apart without having to eliminate any part of the black line and you end up with pattern pieces that really stick to the glass while you cut and grind.

USE A COMPUTER AND SCANNER TO MAKE COPIES

J. Barton: For those of you wanting to make exact pattern copies and don't have access to a blueprint shop, here's my method. I scan the pattern into the computer (I use Presto PageManager) and print it out on transparency film. If you have an acetate copy, reverse it on the scanner so that the numbers are readable when you place

it on the scanner. This places the ink on the bottom of the scanned sheet. If you have a paper pattern, then you'll have to flip the pattern, save it and then print from the saved copy. For a large pattern, you will have to scan in sections and then tape the sections together to form the whole. I apply the transparency to clear contact paper - this seals the ink lines and makes it waterproof. I also find that the contact paper glues to the glass better than the slick transparency stock. I do one clear copy to lay under the glass easel. For my windows, I put contact paper on both sides and then spray it black. I have all my patterns saved to a zip disk so whenever I have need of a pattern, it's simple to print one out.

Deb Bowen: To have exact copies of a pattern made, I take the pattern that I want to be duplicated to a blueprint shop. After the copy has been made, I lay the original over the copy to check for accuracy. They have always matched up perfectly in size.

Emily Klaczak: Instead of covering paper patterns with contact paper, I recommend a laminating plastic (Cleeer-Adheer) that resists water better than contact paper does. Another option is to try quilter's template plastic. It is translucent and much thicker than mylar. You can purchase this plastic at quilt shops.

MAKE MORE THAN ONE LAMP USING THE SAME PATTERN

Ross Lynch: I cut a Worden paper pattern and trace it onto 2mm clear acrylic. On a small bandsaw, I cut out the acrylic pattern pieces to the correct size. (Any fuzziness that occurs at the edges can be trimmed with a knife.) This gives me a pattern that will transmit light when placed over glass. If you plan to make several shades of one pattern, this is not a bad idea.

EASEL HINTS

Vic Seested: I do the easels a little differently. I have clear glass cut for the number of repeats, but I have clear copies made of the pattern (lines of course are in black!) and use a 3m clear spray adhesive on each clear pattern and place them under their glass easels. (If you are careful, you won't need to use Tacky

Wax to hold the cut pieces in place.) When all the repeats are done, I lay the easels out on the light box in a circle so that I can get a good idea about how the lamp will look when it's completed. When I'm satisfied, I remove each piece from its easel and attach it to the mold with Tacky Wax - starting at the top of each repeat and working down to the bottom.

Bill Callow: To cut down on the time it takes to wax glass pieces to the glass easels, melt wax in a container and, by following the reference copy, use a glass eye-dropper to apply a drop of the melted wax to every area of the glass easel that will hold a cut glass piece. This method can also be used directly on the mold to hold the glass in place.

Genevieve Berthet: I wax the whole glass easel with a bar of Tacky Wax rather than using individual balls of wax to hold glass pieces in place.

Ray Goodenough: To keep the wax off my hands while cutting and grinding lamp pieces, I have a little electric potpourri pot plugged in containing Tacky Wax. I use a small brush to apply just a dab of melted wax to the back of each piece to hold it to the easel. (The pot cost \$1.00 at a garage sale!)

Bill Callow: Clear transparencies, rather than paper reference copies, can be attached to the glass easels and left in place during trips to the light table to check the lamp's progress. This eliminates the need of adjusting the easel to the reference copy every time it is moved.

Mitch Garner: My glass easel is really a sandwich with the transparency between two clear glass easels of the same size. This arrangement keeps the transparency in place.

LAYING OUT GLASS AT NIGHT

Carol Conti: I usually do lay-outs at night since a dark studio allows only the light table to illuminate the glass. A bonus is that the glue dries overnight so that by the next day I can proceed with cutting and grinding.

STORING GLASS PIECES

Brian Hitchcock: I'm trying to work on lamps in a very small space that I share with many other hobbies and kids, so I needed a way to store my Pony Wisteria project as I worked on it. First of all, I copied the pattern onto acetate sheets. I then cut out around the overall pattern. Since there are three repeats of this pattern, I bought 3 pieces of clear and 3 pieces of black plexiglass - about an inch or so larger all around than the actual pattern. I traced around the pattern onto the paper of the black plexiglass, then used my Rotozip power tool to cut out inside the pattern outline. I then glued this to the clear piece. Now, as I cut and grind, I can place each piece in its "tray" and carry the tray to my light box. I keep the three trays in a drawer of my workbench - now, kids can't hurt it, it stays clean, and it's out of the way!

SCORING/BREAKING GLASS

IDEAS ON SUCCESSFUL CUTTING

Barbara Grollo: With my pattern pieces laid out on the full sheet of glass, I tend to score the inside curves of each pattern first and, until I have that out of the way, I don't score around the rest of the pattern. (I want the glass as stable as possible for the tugging and pulling that happens as I groze the scores from the glass.) I try to leave as much glass as possible behind the curve for even more stability. Once that's done, and depending on how many pattern pieces are laid out on the sheet, I try to isolate and separate the pieces. At that point I make the rest of the scores that are needed for each piece. I groze and break away the glass in the same order in which they were scored.

Peter Grotepass: The more scores you make around your pattern piece, the easier it is to groze and reach your final inside score without breaking the piece.

Lorrie Gordon: I took a class from Don Able of Morton Tools. Don said that most people use too much pressure when trying to cut art glass because of the challenge to keep the cutter from bouncing around the surface divets. Pushing too hard might result in small fissures on the cut line that will cause the glass to run breaks perpendicular to the cut line."

Carol Conti: Your cutter must be sharp and lubricated in order to make a good score. (To check out your cutter to make sure it isn't skipping, make a score on a piece of mirror.) Too little pressure can result in the glass not breaking for you; too much pressure can cause breakage where you don't want it. Each sheet of glass seems to be unique, so experiment on an edge before you cut into a whole sheet. If you are having trouble cutting and breaking glass, try using running pliers. Heating the glass on the light table also helps the glass make its proper break on your score line.

Lynn Perry: I like to do my cutting on a light box. Unfortunately, the light box glass is not a very yielding surface and causes extra breakage and some poor cuts. To solve this, I put a thin piece of packing foam on top of the clear glass, but then this made it difficult to rotate the glass while cutting curves. The final solution was to put a smaller piece of clear glass on top of the 1/4" light box glass and put the foam on top of this glass. Now I can still see the cutting lines and can easily rotate the glass as I am cutting. When I cut textured glass, I use a thicker piece of foam.

Dick Watson: When you have to cut a small or awkward piece of glass, leave a portion of glass about 2" on the easier side. Cut and grind the more difficult sides first and then break off that extra portion and grind it to fit.

GROZING

SB Anthony: For grozing up to the score line if the break was outside it, I was given this advice: don't twist down as is the natural tendency, pull straight away from the edge.

MORTON SYSTEM

Emily Klaszac: I have used the Morton system for about 10 years, but only for cutting 90 degree angles. It is wonderful if you have to cut a lot of pieces of the same width for a border, to make boxes, etc. but I will not use it to cut gridwork or panel lamps because it is difficult to get an accurate angle consistently through

the cutting of your project. So when doing a lamp with gridwork I use the Morton to cut strips of glass to the depth (vertical measurement) and then use a template to draw angled lines for the pieces.

MOSAIC CUTTERS

SB Anthony: I've discovered that mosaic cutters make excellent grozers when trying to cut a long skinny piece. I cut wide, then nip away the glass until I am quite close to the line. Sure beats grinding!

PROTECT WHEELS WITH OIL

Marie Jo Murray: While attending a Glass Trade Show, I learned that, to save wear and tear on those expensive mosaic cutter carbide wheels, you should dip them in oil - just as you would glass cutters. Also want to let you know that unscented Kerosene works as well as oil!

OIL CUTTER PROBLEMS

Mike Barnes: I use a glass cutter with a built-in oil reservoir, but sometimes the oil doesn't flow. I've found that by unscrewing the top a few turns, air is let into the reservoir allowing oil to flow again. If I still have a problem, I make sure that the wick is in contact with the cutter wheel. (Hold the cutter up to the light in order to get a better view.) If there seems to be a gap between the wick and wheel, I remove the cutter head and very gently pull the wick out until it is in contact with the wheel. At this point, it also helps to dip the wick in some oil.

TIPS ON CUTTING GLASS

*Notes taken by **Nikki O'Neill** during a workshop by **Nancy Underwood** at **Weisser Studios**.*

•Scoring Tools

A Carbide with a narrow wheel angle is our most important tool.

Nancy prefers the cutting wheel of Toyo and pointed out that Toyo heads can be used on other cutters.

•Cutting Oil

Oil facilitates the breaking of the score -it's more important to use on difficult glass, thick, pre-fused, etc. or on difficult cuts. If your cutter leaks, like most Toyos do, you can just dunk the tip of your cutter in oil. *Nancy keeps a small dish with a paper towel soaked in cutting oil handy. She also uses the Toyo with a swivel head.*

•Techniques

Over-scoring will make the glass difficult to break. If you are using a Toyo pistol grip, you should exert just enough pressure to close the spring in the cutting head.

Cut a straight line by using a cork-backed ruler. You can create your own by buying any size metal ruler and gluing cork onto the back.

Also useful is an L-square with a ridge which can be aligned against the bottom edge of the glass.

If you do lots of straight-line cutting you can install a jig. (Such jigs are available at retail glass stores.)

•Running/Breaking Tools

Running pliers: those with metal handles are better because you can feel when the break has started.

Breaking or grozing pliers: Hold these pliers so that the curved jaw is on the bottom (smiling!); however, to break out a long skinny strip, position the curved jaw on top. When using breaking/grozing pliers remember to apply pressure out and down to help the score run from the top of the glass through to the bottom. Don't torque the glass with upward pressure.

Two Morton system "button" based systems were demonstrated for pressing along the score, the bridge and button and the M-80. The Ringstar works along the same principle and both work best using light pressure.

•Principles of Breaking Glass

Glass prefers to break in a straight line and along the path of least resistance. Don't put your pattern piece too close to the edge of the glass in case the glass break runs off the score to the edge. Leave at least 1/4 to 1/2 inch between the pattern and the edge of the glass.

To cut a skinny strip, i.e. one fourth of an inch wide:

1. Score your line using a cork-backed ruler.
2. Use narrow-tipped grozing pliers.
3. Start at one end of the score and gently work from that end toward the other...running the score until the strip comes free. Remember to position the curved jaw of the pliers on top.

•Glass Cutting Rules

The piece you are saving should be bigger than the piece you are cutting away. Don't try to cut a small pattern piece off a big piece of glass; rather, cut off a piece of glass with enough room for your pattern piece plus 1/4 to 1/2 inch extra. Cut tight inside curves first by making multiple parallel scores. Cut them all at once before using narrow grozing pliers. This way, if one score runs straight off the curve, the next score will catch it.

Starting with the outermost score use grozing pliers to work from side to side toward the middle until the piece comes out.

Repeat with each score - working your way in to the curve. (A tighter curve may need more cuts.)

If you have compound curves, you may need to cut more than one series of multiple scores.

Peter Grotepass: If you are cutting glass and find that a particular glass seems to break wherever it wants to, try applying a little cutting oil to the glass before you make your score.

Chaz Smith: When cutting a pattern piece that has an inside curve, score a series of crescent moons so that no score ends up pointing at the pattern piece. Try using mosaic cutters. By function, they remove little moon shaped bits, so it's not too hard to get those inside curves.

To check on your cutting skills, take a piece of glass (window glass if you have it) and make a straight six inch cut using little pressure. After breaking it, look at the edge to see the actual score line. If done correctly, it will be a tiny rough edge with a nice smooth break beneath. Now, make another cut, but press down hard this time. When you check the edge of this one, you will see a more angular break, with some deeper fractures caused by the score. It's those deep fractures that lead the glass to break off-course. Lighter pressure is definitely needed

when working on glass that is uneven in texture and hardness.

CUTTING SPECIAL GLASS

Mike Barnes: Since all glass is different, I do some practice cuts on the glass that I've decided to use for a new lamp. I've found that Youghioghenny takes a softer touch - even laying it down on top of a towel sometimes helps.

Lorrie Gordon: I warm my glass (before starting to cut) by letting the glass sheet rest on an old heating pad until it's warm to the touch.

Ed Minas: When cutting ripple and heavily textured glass, I place a piece of inch thick rigid styrofoam under it. This trick really prevents unplanned breakage.

Carol Conti: Experiment by tapping the underside of your score on drapery or other heavily textured glass to facilitate a clean break.

Barbara Grollo: After having numerous pieces of ripple glass break in the valley instead of at the hill, I pulled out my mosaic cutters and used them to snap the glass at the correct spot. I also found that it worked well for grozing away small areas. I found that my regular groziers kept slipping off the ripple glass, but the blades of the mosaic cutter were able to grip the glass. This tool might not work as well for the usual glass pieces, but for borders it was a real "glass saver".

Chaz Smith: Cut on the smooth side of drapery or ripple glass, but beware of the knife-like edges that can be left on the peaks of this glass as you break it. (You can use a grinder to smooth away dangerous areas.) As to the issue of foil, I use 2 mil since the extra thickness gives more material to stretch as you burnish. I use 7/32nd foil and apply it with the right amount of overlap on the back. Burnish the edge and back, then go to the valleys on the front. I don't worry about peaks that extend beyond the foil - just leave them exposed. Work the foil over and down the sides of the peaks. If the ripples are small, you'll be able to burnish right to the bottom of the valley without tearing the foil. If they are high peaks, it's impossible to keep foil in contact with the bottom of the glass, so I burnish down as far as I can without tearing the foil. then lightly burnish the foil in the middle so that it folds over with the edge pointing down towards the glass. This way, there are no tears, no apparent loose foil edges and the valleys are sealed. In places where the glass has few ripples, 7/32nd foil is really too wide, so I trim the foil with an exacto knife. Small foil tears can often be covered later as you do your beading with solder.

Larry Cartales: I worry about exposed ripples so I use several widths of foil - even up to 1/4" wide. I sit as patiently as I can with my sharp exacto knife and trim the foil so that I end up with an even overlap all around the piece.

Pierre Leblond: If I want the deep (3 or 4 mm) ripples on borders or trellisses to face outwards, I add foil to cover the exposed peaks. I straighten the foil in the valleys with a scalpel - which is tedious work! If I have the ripples facing inwards, I bevel the peaks slightly with a grinder (except for the edge against the rim). This accomplishes two things: it makes foiling and fitting easier and it ensures no cut fingers from any exposed peak when I handle the shade.

GRINDING

GRINDER BITS

Joan Bengston: On the subject of grinder bits, I have had grinders with both the 1" and the 3/4" bits. Either one is fine although I think the 1" cuts a little faster because of its larger circumference running the same speed. My grinder also has a platform for the 1/4" bit and I have an aquarium pump drip that can easily be toggled between the sponges on either level. There are coarse abrasive bits that are available to cut faster, but they chip the edges more. That being the tradeoff, I will stay with the regular bit.

Dick Watson: Whilst using the 1/4" grinding head on the top of the grinder shaft, I found that it gradually worked loose in the brass body, despite attempts to tighten it with pliers. I successfully solved this problem by wrapping a few turns of white plumbers thread tape around the thread on the grinding head.

Nancy Pimental: The Inland Drop On Bit takes care of having to purchase an extra grinder just so you can move quickly from one grinder with a speed bit to another with a regular bit. Lubricate the grinder's shaft slightly before putting it on, but once the adapter is in place, it takes only a few seconds to switch from regular grit to speed grit.

GRINDING DIRECTION

Walt Boepple: I move my glass in all directions when grinding but there is a natural way that it is easier using the torque of the bit. The pressure that I put onto my fingers changes as I move the glass into the bit knowing which way the glass is going to be pulled when it touches. Most of the time, I move from right to left since the bit is turning counterclockwise.

Barb Grollo: I read in an article on grinding that the "correct" way to grind, is to move the glass from the right side of the grinder to the left side, "never" back and forth. It states since the head rotates counter clockwise, you should move your glass into it, not with the rotation. In this article, they guaranteed less chipping using this method.

GRINDING SEQUENCE

Barb Grollo: For my last lamp, I cut pattern pieces for all three repeats of the Peony, and cut quite a few pieces, then would take a break and grind them right up to the pattern. Then I'd soak off the pattern, clean the glass and mark the pattern number on the glass (itsy, bitsy mark, so as not to interfere with foiling) After that, I placed them on the glass easel and continued. When I finished the three repeats on easels, I started placing the glass on the mold and just had to do some "fine-tuning" with the grinding.

Jennifer Buckner: I cut the pattern through the middle of the black line, but then try to cut the glass right on the line. However, when I'm grinding, I grind so that, when the glass piece is lying on the layout copy, you can see at least half the thickness of the pattern line all around the outside of the glass. This is where my pins come in - I hold each piece of glass in place on the layout board with the same pins I'd use on a Worden mold. I stick them down into the cork (under the layout pattern) just enough to keep them upright, but not deeply enough to make them difficult to remove. This way, I'm assured of having a tiny space between each piece. When the grinding is completely finished I have (ideally) black lines

between all the pieces. This leaves enough room for the foil (usually 3/16 or 7/32) and a tiny bit of solder to run through, giving the final project some strength without having excessively thick lines.

Marie Jo Murray: I cut all the glass for the entire lamp then grind...clean the pieces a bit, and with the pattern on the pieces, put them on my mold. When I am ready to foil, I take the pattern off, clean the piece of glass better, foil it and put it back on the mold...(I found out it was saving time by writing all the pattern numbers on the mold) Very few pieces need " fine grinding" because I try to do my best the first time.

RUBBER FINGER DO-DADS

Karie Gregory: To protect your fingers from being cut up while grinding, use rubber fingers that office personnel use for handling paper. They come in different sizes and are remarkably durable considering their pliability. Of course there is a minor compromise in dexterity, but no more than with taped-up fingers.

DRILLING HOLES

Mary Ritter: Drilling a hole in glass is easy. Just hold it on the top of your 1/8" or 1/4" grinder head and grind through. Be sure to keep a wet sponge up against the head and resist the urge to stop and peek to see how it's coming, because it's hard to get the glass back into the exact position.

SB Anthony: I drill glass successfully with a diamond-tipped drill. Use anything from plasticine to plumbers putty to make a dam around the potential hole. Pour in some water and then drill, using a push-then-backoff motion. To avoid chipping when the drill finally breaks through, either ease up on the pressure when you get near the end or turn it over and finish drilling through from the backside.

REMOVE GRINDER SLUDGE EASILY

Hap Webb: I line my grinder water reservoir with plastic wrap. This way it's easier for me to lift that sludge out and dump it into the trash.

Joan Bengtson: Instead of cleaning the reservoir of the grinder in a sink, I make sure the solids have settled to the bottom before carefully draining off the water....just until the sludge begins to get disturbed. Then I scrape the sludge onto a section of newspaper and throw it away. By doing this, I keep the drain pipes clear of glass grindings that might cause blockage.

"STUCK" BITS

Kevin Hendon:Picture this, everyone! Both feet on the top of the G8 grinder holding channel locks and trying to pry off the bit and, at the same time, yelling at it! Well, I did manage to get the bit off but in the process I bent the shaft. Oh, it still grinds, but I need a seat belt to use it. I learned my lesson and have to be more careful to maintain the bit on my new grinder.

Jim Clark: Been there - done that. Now I use graphite lubricant on the shaft. It's a lot less expensive, plus, one doesn't have to take high blood pressure meds. Recently, a lady brought an old grinder into our shop, and a friend used a wheel puller to remove the bit. I had trouble getting a new bit on, so I wet the shaft, turned the grinder on and then used a little fine grit water sandpaper on it. It really cleaned up the shaft.

SB Anthony: The product I use came with my grinder and is called Permatex

Anti-Sieze. It has worked well for me. Years ago I bought some (under another name) at a hardware store.

Hap Webb wrote: "To keep the bit from freezing up, I just use a little Vaseline on the shaft. Works great!"

Jennifer Buckner: If you have trouble with bits getting stuck, try coating the grinder shaft with a thin layer of silicon.

DON'T GET CUT!

Carl Chapman: I try to cut accurately, but am not ashamed to let the grinder do some work on difficult curves. One thing that I do that helps avoid finger cuts, is to make a light pass with the grinder over the piece to take off any nasty burrs, then, if I have to press hard to get to my line, there is less chance of getting cut.

MARK THE BIT

Marcia Holtzclaw: I found that it helps a lot to draw a line around the base of the grinder bit with a black magic marker. It was then easy to raise the bit just high enough to grind a piece of glass and not waste any of the surface.

SAWS

Joan Bengtson: Taurus has two sizes of blades, but when you purchase the saw, it comes fitted with the larger blade. The plastic grommets and guides on the Taurus have to be adjusted for the least amount of flex in the blade. You have to be careful not to push too hard on the blade - let it cut with the minimal amount of pressure. It's the constant flexing that hardens and breaks the blades. The company recommends cutting at a 45 degree angle to the blade - left or right - and only minimal use straight on. If possible, do not pull against the back of the blade.

Lynn Salcetti: For those of you who use the Taurus II, here are some helpful tips that I received from the Gemini Company: If you live in an area that has hard water, add up to half a cup of vinegar to the waterbath to eliminate calcium buildup and increase bearing life. Add a couple of drops of detergent to the water to keep your saw running smoothly. Empty the waterbath after a day's use. (This is not absolutely necessary, but it helps the life of the parts if the water is changed frequently.) Add ice to the left side of the waterbath.

Clean the saw on a regular basis by adding a liberal amount of detergent to the water and let the saw run for a few minutes. Rinse well.

PRESERVING PATTERN LINES

Lois Myers: To preserve lines when using a saw to cut your glass, draw out your cut lines on the glass with a permanent marker. Let the ink line dry and then go over the line with Chapstick! The Chapstick works well and is so clean and easy to use compared to Vaseline or Markstay.

Walt Boepple: As I was trying to glue pattern pieces onto glass, I spotted a bottle of rubber cement on my work bench. I took a liberal dip with the brush and put it all over the edge of a pattern piece and the glass. It really worked well! The rubber cement formed enough of a dam to stop most of the saw's water from lifting the pattern from the glass and yet it didn't plug up the saw.

David Crawcour: When using a bandsaw, the line drawn around a template is washed away by the coolant and so the cutting line is lost. What I have found to alleviate the ensuing frustration is, after marking the glass, cover it with a good

quality of transparent tape. The one I use is described as thick, strong, waterproof, tough polyethylene tape. It is easy to remove after the cutting operation.”

Susan Slack: I use a product called Mark-stay to keep lines on my glass when using the saw and/or the grinder. It comes in a small jar and costs about \$4.

MAKE YOUR OWN SAW

Walt Makos: By adapting a Sears Craftsman 1/3 HP band saw, I saved the cost of a glass ring saw. After installing a 54” diamond blade and a ground fault interrupter (to eliminate any electrical hazard), I set up a drip system to keep the blade wet and then I placed the saw in a plastic container to help eliminate splashing water. If you plan to try this adaptation, make sure that the blade you buy is compatible with this saw.

FOILING

DETERMINING WIDTH

Carol Conti: In order for the adhesive on the foil to “take” to the glass when you foil, make sure your hands are clean and dry and don’t use hand lotion. Also, make sure each piece of glass is clean and dry. Copper foil is available in widths of 1/8” to 1/2”. The width of foil should be matched to the thickness of the glass plus an allowance of 1/32” or less for overlap on each side of the glass. The most frequently used width for lamps is 3/16” however 5/32” is used for slightly thinner glass and 7/32” for thicker glass. Black-backed foil is used on glass (such as fracture glass) if there is a possibility of the copper backing showing through.

Sue Gorden: The shade I am ready to foil is made of Oceana and Youghioghney glass. The instructions for this shade say to use 3/16” foil. Since I already have a ton of 7/32” foil, could I use that instead and use 3/16 on the smaller pieces so the lead lines are smaller?

John Cannon: You can certainly use the 7/32” foil on the glass pieces and may choose to use the 3/16” on the smaller pieces. If you were careful to cut and grind the glass and tried to minimize the spaces between the glass pieces, the increase in foil widths between using 3/16 and 7/32 is a mere 1/64” on each side of each glass piece and on each side of the gap between the pieces. I believe it is the skill used in cutting, grinding and fitting all the foiled pieces together that contributes much more to the finished look of a shade than the difference in using difference widths of foil. The thickness of lines is really a matter of personal preference, and like so many things in lamps, each person gets to make his own choices.

Twyla Morgan: Many years ago, my first glass teacher taught us to try to keep lead lines at one size on the outside of the shade. This meant, in some areas, having more of an overlap on the back than on the front. The width can also be controlled by the size of foil you use. If you have more of a gap between pieces than you want, you can use a very narrow foil as long as you have a little overlap on the glass. I keep several widths available in my foil holder.

RESTORING ADHESIVENESS

Ross Lynch: Every once in a while I get a roll of foil that won’t stick to the glass. Before I foil now, I preheat all the glass with a small electric fan heater. This improves the bond between the foil and glass and be very handy when you foil irregular-shaped pieces. It also makes it a bit easier to trim back any excess foil later on.

Chaz Smith: To help restore the adhesiveness of foil, use the heat of your light table to warm the pieces of glass that are to be foiled.

Joni Tornwall: While foiling my latest lamp, I discovered there were some sections on the roll of foil that did not seem to stick. I tried burnishing it really good and that seemed to work, but when it was time to solder, it turned into a nightmare.

Vic Seeted: I’ve had the same problem with “non-sticking foil” but I think the problem is with the glass and not with the foil. My solution was to use sandpaper on the edge of any glass piece that I was having trouble with and then the foil would stick much better.

Julie Stearns: I was taught by **Larry Cartales** to use isopropyl alcohol on my glass pieces if the foil doesn't want to stick.

Vic wrote back: I tried Julie's hint on my latest project and it does work! I just wipe those glass pieces with alcohol and it's almost like a magnet - the foil sticks to the glass like glue.

Mike Barnes "Just in case alcohol or other cleaning methods don't help, I have used Tacky Wax on the back of foil in hard to stick areas as was the case when I used extremely irregular Drapery. I use denatured alcohol. It's made of ethyl and methyl (denaturant) so you get almost 100% alcohol with maximum evaporation. However, be sure to use it in a well-ventilated area."

Ernie Downey: You might consider an alcohol bath. Pour some alcohol into a shallow pan and pass each piece through it as part of the final cleaning process. If you have many pieces that the foil won't adhere to, the "bath" would eliminate the possibility of any problems.

Bob Tesch: Why does the alcohol help? Because it cleans the glass. When foil won't stick, the first suspect is unclean glass. Just handling the edges can put body oil on the glass that is not easy to see.

John Cannon: I agree with Bob. I suspect the non-sticking issue is directly related to cleaning the glass properly. I've found that as you handle the glass it warms slightly which also allows it to accept the foil better than cold glass does. The age of the foil may also play a part in this, but starting with clean glass and burnishing the foil edges against the glass as foil is applied will go a long way in leaving good foil edges until soldering can be finished. Another point is that the age of foil will also play a role in flux not sticking to it if the foil has oxidized. A light rubbing with fine steel wool will allow the flux to stick and this will allow the solder to flow and stick to the foil. Without flux and enough heat, the solder will not coat the foil, but will tend to bead up on the surface and not adhere properly.

Bill Geller: One added suggestion while we're on the topic of foil: I have found that old foil does not have great adhesive holding power, so I wrap the foil in Seran-wrap or put it in a seal-type baggy - expelling as much air as possible. This type of storage seems to keep the foil fresh & tacky."

Chaz Smith: My guess about foil not sticking is that there is moisture on the glass. Glass stays cooler as the room warms up, and thus is a target for condensation. The alcohol wipes away the condensation, and then evaporates itself, leaving the glass dry so the foil sticks. Likewise, heating the glass dries it which allows the foil to stick. I used to work in at a place that dealt with optical devices. We never used denatured alcohol on the glass, as it left a residue when drying. Instead, we'd use pure grain alcohol that was purchased from a liquor store.

DIFFERENCES IN ADHESIVENESS

Patti Curtin: It's been my experience that black-backed copper foil has the best adhesive. That's followed by regular copper foil. Silver-backed copper foil has the poorest quality of adhesiveness. So, if you need to use silver-backed foil, try using the silver-backed silvered foil. The adhesive is just as good as the black-backed copper foil. There is silver on both sides of this foil, and it's a little more expensive, but it's worth it in the right application. Personally, I use the black-

backed copper foil unless I'm foiling something very light in color, like whites or yellows or pinks. The black-backed foil really does leave a dark shadow, whereas the silver-backed silvered foil doesn't.

PROTECT ROLLS OF FOIL

Hanka Nowakowski: To care for my unused rolls of foil, I wrap them in plastic and keep them in an air-tight can with a lid.

PROCESS OF FOILING

Carol Conti: Center the glass on the foil leaving the same overhang on either side. Wrap the foil around the entire glass piece, pressing it to the edge with your fingers as you go. Overlap the foil about 1/8th inch before cutting it off. For glass pieces along the rim or top edge of the lamp, don't start the foil along the exposed edge since it might come loose during soldering or releasing. An inside curve should be foiled starting at the deepest point of the curve. Start pressing the foil down on one side of this piece and then carefully repeat on the opposite side. This helps eliminate tearing the foil.

FOILING RIPPLE GLASS

Mike Barnes: Use 1/4" foil and trim the areas that look too wide with an X-acto knife. Generally, I also use 3/16" foil, but when the glass dictates, I've had to use 7/32". Sometimes, when the foil doesn't cover the glass properly, I overlay another piece of foil on that area.

Chaz Smith: I use the 7/32nd foil in 1.5 mill to wrap ripple glass. It covers the high points. In the low points, I burnish the foil over past 90 degrees so that it folds down towards the glass. That makes the lead line narrow again. If I come to a flatter area of glass, I trim off some of the excess width. I find the thick foil is necessary, since the thinner .001 or .00125 thicknesses tend to tear.

Carol Conti: You might want to cut your own foil strips from sheetfoil to wrap heavy ripple or drapery pieces. I found that this method of making individual strips for glass with unique thicknesses will save you time and frustration in the long run. You could also use additional strips of foil to achieve the required overlap on the "peaks and valleys". Make sure the back edge of this special glass is properly foiled.

FOILING JEWELS, GLOBS & MARBLES

Joan Bengston: It's easier to trim a strip of foil lengthwise with a scissors while it still has the paper backing on it rather than fussing with an X-acto knife. Most jewels have a thinner edge that you can fold the foil around and it's just as stable as the glass. At times when using glass globes or marbles (on flat panels) that have such broad edges, I grind a shallow groove around the circumference where the foil is going to go. I press the foil into the groove and make sure the solder flows down well between the pieces. That holds it tight so you can't push it out. I put the almost finished panel up on props before placing the globes or marbles and then finish the soldering.

FOILING A "VALLEY"

Dick Watson: When foiling glass pieces with a sharp return or "valley", try starting your foil in the middle of the valley and allow your usual overlay. Rather than trying to bend the foil down completely in one go, gently stretch with several rubs.

BURNISHING

Carol Conti: Use a lathekin (dowls or wooden rollers also work) as a burnishing tool to press the foil onto all edges. The foil must be pressed as flat as possible so that no dirt or flux can leak under the foil causing later problems with soldering or patinating. Always lay the foiled piece on a clean, flat surface when burnishing.

BURNISHING SURFACE

S.B. Anthony: A computer mouse pad makes a great surface on which to foil and burnish your glass pieces.

USE THE SEPARATING FEATURE ON YOUR FOIL DISPENSER

Joan Bengtson: As you feed a strip of foil through the opening of your foil dispenser, take a second to separate the backing from the foil. Following that, the dispenser will automatically peel off the backing as you work.”

HOLD YOUR DISPENSER IN PLACE

Jennifer Buckner: I use a foil dispenser, but found that it wanted to slide off the edge of the table while I’m foiling. My solution was to cut a little square of rubberized mesh shelf liner and put it under the dispenser. Now, it stays in place.

ELIMINATE OXIDATION ON FOIL

Sandy Stringfellow: I’ve had no problems with oxidation. When I’ve finished foiling a section of a lamp, I put Saran Wrap over that section and then cover the whole mold with a big plastic garbage bag. (I don’t know if the bag did any good, but it made me feel better.)

Joyce Mattson: If your foil is showing the effects of oxidation because it hasn’t been covered with solder yet, use a piece of fine steel wool dipped in flux and gently rub away the oxidized area before you continue to solder.

FITTING GLASS ONTO THE MOLD

CUT TO THE PATTERN - NOT TO THE MOLD

Carol Conti: Here are some things to know about Odyssey patterns and molds - the size of pieces on the mylar pattern is true. The size of the mold is true. The lines on the mold are approximations. So, cut your glass pieces by following the mylar pattern. Use the guidelines on the mold only as approximate areas on which to place your glass pieces. The following words explain why the design on mold is an approximation: To make a pattern of a Tiffany design, the original lamp is layed up with architect's linen and the complete design of the lamp is transferred onto this linen. Only one of the hand-drawn repeats of the design is used to make the mylar pattern. The linen is also used to trace the design onto a blank mold. That design is scribed, again by hand, onto the master mold. There will be variations on the mold from one design repeat to the next...given the frailties of us humans.

Walt Boepple: Do not grind your pieces to fit the one on the mold. Just begin to put them on the mold and all will be fine. After they are all foiled you begin to move around the mold and make little tiny shifts in the pieces, moving them one way or another until you have the best fit you can.

CHECK SPACING OF GLASS PIECES

Lynn Perry: A foil guide can be used to check the spacing between glass pieces as they are attached to the mold. The guide can be made by simply folding a piece of foil over itself toward the sticky side, three or four times.

TURNTABLE

Walt Boepple: A turntable that holds the mold would be helpful when applying the prepared glass pieces to the mold. It can be made by mounting a wooden disk onto a simple Lazy Susan. For about \$13 you can buy a Lazy Susan at a hardware store.

TACKY WAX

Carol Conti: When it's time to attach your glass pieces to the mold, don't bother waxing the mold. Use the same wax that holds the glass pieces on the easels to hold them in place on the mold. Use more wax to hold larger pieces or to build up pieces if it is needed. If your easels have been laying on a warm light table, you'll find the wax pliable enough to remove the glass. If you have trouble removing the pieces, an old dental tool can be used gently as a prying instrument.

Lynn Perry: Use a heat gun to smooth the wax on the mold and to remove wax from the mold at the end of the project. The gun can also be used to remove wax from the inside of the lamp after it is released, but because of the potential high heat, be careful!

Ed Minas: Often I find the balls of wax lose their tackiness on the mold and won't hold the glass in place. For this reason, I always keep a hand-held hair dryer handy. One quick pass over the area of the mold where I am working and the wax is sticky again. As I fit glass pieces to the mold, I place a piece of foam rubber under the mold. The foam rubber should be larger than the mold by about 3 inches all the way around. The foam cushions the fall of any pieces that may fall off the mold as well as preventing any stray pieces from bouncing off the work bench and onto the floor.

FINAL CHECK OF THE FOILED LAMP

Carol Conti: After the foiling process is complete, check the shape of the foil. If you see any errors, they can be trimmed with a precision knife. Make sure there is plenty of wax holding the bottom row of glass pieces in place and that the larger pieces are secured to the mold with extra wax. If any glass piece seems to have sunk below its adjacent pieces, now is the time to brace it forward with more wax.

MAKE YOUR OWN TACKY WAX

Joan Bengtson: Over low heat, melt one pound filtered beeswax with 1/2 cup Vaseline petroleum jelly. Stir occasionally until all solids disappear. Pour into a flat 9"x13" baking pan that is lined with kitchen plastic wrap. When cooled and solid, turn out on a cutting board. Remove plastic wrap and cut into blocks. It isn't necessary to use expensive candle grade wax. I buy #2 grade (tan colored) wax from a local nature center. It smells heavenly when it is melting!

ALTERNATIVES TO TACKY WAX

Ross Lynch: I use BLU-TAC instead of Tacky Wax when I build lamps. There is no mess to clean off after the soldered lamp is released from the mold and the pieces of BLU-TAC are easily removed for later use. Hobby shops sell it.

Jim Gossum: Years ago, there was some mention of using poster putty rather than wax to hold your glass pieces to a mold. I decided to try it out when I found a product made by Super Glue called Poster Tac. Since this "discovery" I've built three Odyssey shades using the following method: take one strip of putty and knead it until it becomes soft and pliable. Pinch off a small piece and roll it into a ball. Push it onto the mold in the center of each pattern space. It really doesn't take a big piece - just a dot, actually. A larger piece of glass might require a slightly bigger piece, or maybe even two pieces of Poster Tac, but only use enough to hold the glass to the mold. Experiment! Less is better! The glass needs to be dry, so if you're grinding and fitting onto the mold, dry the glass before pushing in onto the putty. You can remove the glass from the mold and replace it as many times as you like. You may very well have to pick off the dot of flattened putty and roll it into a little ball again and put it back on the mold. It holds for a long time. (I hate to admit it, but sometimes, months....) The rest of the process is much the same. I've had no problems soldering. Release works very much the same. Poster Tac does not liquefy, so heat only makes the Poster Tac more soft and pliable. (Remember: use small dots of Poster Tac!) There is a little oily residue that occurs from heating as well as flux residue, but clean up is MUCH easier. I scrape the dots of putty onto a paper towel and then use clean paper towels to wipe down the mold. After removing any putty that stuck to the glass on the inside of the shade, I am ready to solder the inside of the shade.

Arthur Haft: You can take a large wad of putty and apply it to the small pieces left on the glass (or mold) and it lifts up the little pieces almost completely. These products are not toxic and can be cleaned with water.

Joni Tornwall: I've used Poster Putty on two lamps and found no problems when it came to releasing the shade from the mold. I ran some warm water into my utility sink and put the mold & shade upside down in the water. When I came back in about ten minutes, I carefully squeezed the edges of the mold in toward

the center. (The glass shade also wants to bend in a little, so I was careful!) I tried to make sure that water got between the glass and mold. After a little squeezing and prying the shade away from the mold with my fingertips, the shade easily separated from the mold.

LAMP POSITIONERS

COMPARISONS OF LEVELERS

Lynn Perry: Use a panavise (or any type of device that allows rotation and elevation changes of the lampshade) when you solder. The positioner needs to be attached to a board that is clamped or screwed to the worktable. This extends the shade from the edge of the table and allows complete freedom to position the lamp without being blocked by the table. The small Panavise positioner sold by glass suppliers is suitable for lampshades as large as 20" in diameter. A stronger Panavise, "The Rock", will handle larger shades and can be ordered from Wood Carvers Supply, Inc.

Chaz Smith: I use a basic positioner to solder both the inside and outside of my lamps. The tip of the positioner, where it attaches to the lamp, is a threaded rod. First, I rough solder the lamp while it's on the mold. I then remove the lamp and add reinforcement wires to the top ring. Then I use a wheel and a piece of masonite to hold the shade to the positioner. To solder the outside, I put the wheel on first, then the shade, then the masonite disk which is just larger than the ring. I tighten this on with a wingnut and washers. To solder the inside, I first put on the masonite, then the shade, then the wheel, and fasten with wingnut and washers. So for soldering the outside, the shade is like an umbrella over the positioner, and for soldering the inside, the shade is like the top of a wine glass, cupping away from the positioner. The wheel is slightly thicker than the ring, so this allows the shade to rotate freely.

Scott Riggs: I bought a used pull-type golf cart for \$35 - just so I could use the handle. After cutting off the handle, I attached a threaded rod to the golf cart handle using liquid weld and attached it to my workbench. The handle is adjustable, so it keeps the lamp level at any angle. (When I need to use the jig, I've already installed the ring in the lamp, so I can easily solder the inside of the lamp with this jig by securing the ring between two wheels on the threaded rod.

Peter Grotepass: There is no need to use a lamp positioner with the following technique that I've developed.

- After the glass pieces have been waxed securely to the mold, center the mold under an overhang of sorts. *Examples: use a basement ceiling beam or use a stable anchor to hold a hook in a finished ceiling.*
- Attach a rope, wire or chain from that point and find the center of the mold.
- Pull the rope through the center and let the lamp hang free from the hook.
- Place a chair directly below the lamp.
- Sit in the chair and place your knees inside the mold. Use your knees to hold the lamp steady or to rotate the lamp while you solder. This way, you can use both hands for soldering and, as you work, you can keep the area you are working on in a horizontal position.

Sandy Stringfellow: My lamp-leveling device, Worden Lamp Leveler, sits on a 2 inch pipe that is bolted to a piece of plywood.

Bob Plagmann: I'm using the Worden Flexible Head Adapter mounted on a photo tripod as my lamp position. For small lamps this worked well, but it tipped over while I was working on a large lamp. I solved the problem by taping 5 lb. dumbbells to the bottom of each leg. Now it works like a charm!

LESSONS LEARNED

Tom Trimble: Here are a few *unique experiences* I had as I soldered my 18" Grape - a big, awkward and heavy shade. First of all, the shade (and lamp positioner) tipped over on me because the bronze branches made it so top-heavy. I managed to grab it before it hit the floor but not before it banged into a few sheets of glass that were propped up against the wall. It broke 3 sheets of glass, but luckily, the lamp did not sustain any breakage. I also managed to get a nasty burn on my hand from the soldering iron when I grabbed the lamp...there was *no way* I was going to let that lamp hit the floor! (At this point, I decided to fasten a circular wooden disc inside the lamp which, I discovered, helped greatly in supporting it.) After soldering in 5 reinforcing wires, I noticed a hair-line crack in one of the leaves, so I removed and replaced that leaf. Thankfully, this turned out to be not all that difficult a task. Now, after all those soldering *events*, I am very satisfied with the lamp...it sure makes a statement in my family room!

WIRE BASKET

Bill Geller: I am mindful that we all have our own way of soldering the inside of a shade; however, laying a shade on its side, especially a large shade, might distort the integrity of the sphere/globe. Because of the weight, it is too "soft" even if you use the support of wedges. I use one, two or even three brass rims - depending on the size of the shade, and tack them at different places around the outside of the shade. They create a wire-type basket that cradles the shade and helps prevent distortion. Using this method, you end up with a shape that more perfectly matches the mold.

SOLDER/SOLDERING

DIFFERENCES IN 50/50 AND 60/40 SOLDER

Jill Ballam asked: I usually solder with 60/40 and use a 100Watt Weller iron. Recently, while working on a lamp, I changed to 50/50 solder. I tried repeatedly to re-work my lead lines, but couldn't get them as smooth as I wanted. Is this a feature of the solder? **Lorrie Gordon** answered: Your experience is a feature of 50/50 solder. You switched from a solder that was 60% tin to a solder that was 50% tin. Tin gives solder its "freeze point", and the lower the tin, the slower the freeze. So your 50/50 solder remained molten longer, resulting in the seam reflecting any and all movement around it. However, you can make this work to your advantage by also realizing that the tin also impacts the "melt" point of solder, with the higher the number, the quicker the melt. So you probably noticed that your 50/50 took a little longer to heat up and melt. One tip I picked up is to solder the inside of the lamp with 50/50, then switch to 60/40 for the outside of the lamp. You will experience less melt-through because the 50/50 on the inside is heating slower than the 60/40 on the outside, and helping to "dam" the outside solder.

Derek Windram: The difference between melting points of solders, say 40/60 to 60/40 is only around five degrees. The biggest difference is the "elastic" properties. 40/60 goes from solid to liquid relatively slowly and passes through a pasty, crystalline stage. When it sets, the reverse occurs. 60/40 goes from solid to liquid very quickly and appears to bypass the pasty stage. If you consider this, you will realize why you get less "ridging" when you use 60/40.

FLUX

Joan Bengtson: If you start to experience allergic reactions during a soldering session, I recommend using a water wash-off gel called Fluxomatic instead of your usual flux.

Dave Hammond: When I worked in a commercial glass studio, we experimented with different types of flux to try to find out why tiny holes were appearing in our lead lines. Our conclusion was that the water-based flux that we used boiled too much and was causing these holes to appear. We tried various brands of paste flux and found the the flux used by plumbers is just as reliable as any well-known brand at half the price. Plumber's flux has a slightly thinner base which makes it easier to spread.

TINNING

Chaz Smith: When tinning a shade, I use a wet sponge to clean off extra solder and flux while the solder is still hot. This gives a very thin, even tinning. Then I go back and flow a solder bead over the entire surface.

Paul Crist: Before you start tinning, be sure you will have time to complete the tinning of both the outside and inside of the shade within a day or two. The flux you are applying is corrosive to the copper foil in your lamp and will eventually produce a green encrustation that is difficult to solder through. Even though you are working on the outside of the lamp, some of the flux will get through to the inside.

BEADING

Paul Crist: Use an iron between 100 and 175 watts, because you need control

rather than heat to bead. You must be able to hold the lamp steady at all angles, so that you will always be soldering on a horizontal surface - if not, the molten solder will flow toward the downhill side, creating a bump or seam. First of all, re-flux all the lead lines to be beaded, even though there is a lot of flux left from the tinning operation. The trick to beading is using the right amount of solder with the right amount of heat for the right length of time. Too much solder will create a high bead that is hard to control. A good bead should be less than 180 degrees of curve - somewhere in the range of 120 to 140 degrees. You want to apply enough heat to melt the lead line from 1/8" to 1/4" on each side of the soldering tip, but not so much so that the solder sinks through the lead line to the other side. You also want to leave the iron on the bead long enough to get the solder hot so it won't "peak" when you pick it up, but not so long as to cause the solder to sink through. Often, enough heat is provided by using only the corner of the tip on the edge of the bead. Work along the lead line, so the adjacent area is still hot and will blend with the area you are working on. This requires a good deal of patience at first, but, with practice, it will become easy.

THIN SOLDER LINES

Mary Ritter: To achieve thin solder lines involves beveling the back edge of each piece of glass by tilting it and taking a bit off that edge. It takes only a moment or two to do this with your grinder. Test the "why" of this method by holding up two adjacent pieces of glass and tipping them to the approximate curve of your mold. You'll notice that when the back edges meet, there is a significant gap at the front side of the glass which would have to be filled with solder. This results in thick solder lines on the outside of your shade. However, when the individual pieces are beveled, the result is a thin outer surface solder line and a thicker inside solder line. This equalizes the width of the outside/inside solder lines, while minimizing the outside and maximizing the inside solder lines of a shade. When I cut out my pattern pieces, I only cut once, between the pieces. After I've traced the pattern piece onto the glass, I score the glass just inside the black line that I've drawn. This results in a nice, close fit. I finish off by beveling the inside edge of the piece.

Jennifer Buckner: I used to get very tense while soldering because I found it so difficult. Then my glass teacher taught me to put down a series of "dots" of solder along the foil line rather than trying to run a consistent line from a spool of solder. Once these dots are in place, I go back and melt them into a bead. Now, I enjoy the soldering phase of a project and do a much better job. I no longer have those ugly accumulations of solder at intersections and fewer "pits", too. I use a very narrow tip on my soldering iron.

Lynn Perry: When I'm beading the inside of a shade - especially one that is very curved, I need a third hand to feed the solder, since I am positioning the shade with one hand and holding the soldering iron with the other. I solved the problem by cutting about 12-18 inches of solder off the roll and soldering one end of it to a seam inside the lampshade. The loose end is near where I am working so it's easy to reach with the soldering iron. Another plus is that any solder drips fall inside the lamp and not on me!

Carol Conti: I bead the outside of my lamp with 60/40 solder before I release it

from the mold. (It melts faster so I can get a smoother bead.) Because of the heat passing through the beading - which is done on the inside of the lamp, the outside solder always looks smoother. I use 50/50 solder on the inside. If sputtering occurs, it is possible that there is dirt or too much flux on the solder. Wipe it off and try again. You might have to use a bit of very fine steel wool to remove possible oxidation.

ELIMINATE DRIPPING SOLDER

Marialyn Prange: Because I also do a little spinning and weaving, I have lots of fiber around the house. I found that wool is a great material to use when trying to keep solder from falling through to the other side whilst beading a lamp or smoothing hot solder around the rim of the lamp. Wool absorbs water and insulates much better than cotton. It does not ignite and burn nearly as easily as cotton. So, get yourself a piece of wool with the hide still attached - like an old bicycle cover or scrap of sheepskin from a car seat. Another way to smooth out solder is to use a brush that is wider than a flux brush; small natural hair paint brushes work well.

PROTECT YOUR LAMP BETWEEN SOLDERING SESSIONS

Mary Ritter: Ignore any flux left on a soldering project in progress. Whatever you do, don't wash it off with water or other chemicals. If you feel more comfortable doing so, cover your shade with plastic to protect the foil from dirt, air and humidity between soldering sessions. Scrub your completed lamp well before applying patina. If any areas are blotchy, try dipping a bit of (very fine) bronze wool into the patina and gently scrubbing that area to which you are applying patina.

IRONS & TIPS

Joan Bengston: As for irons, I use a 100W iron with a 3/8" tip on a rheostat for general use. I have a variety of tip shapes but for beading on foil I prefer either a pyramid tip or a chisel tip rolled over on its side edge. I can melt the solder on the vertical flat surface of the chisel and it flows nicely into the bead. It's frustrating having to stop periodically to wait for the iron to heat up again, so for heavy duty work like tinning the cast brass lamp rings and rims, etc. and also for soldering foiled flat panel windows I use a 250W with a 1/2" chisel tip. It's kind of heavy but it holds the heat steadier than a smaller iron. I can work a lot faster with it. I keep it on the rheostat, but I usually find myself setting it as hot as it will go.

CARE OF THE IRON'S TIP

Dan Rose: To clean the tip of your soldering iron, make a 1/2" indentation in a block of Sal Ammoniac and fill the indentation with solder. Run the hot iron across the block and through the solder until oxidation is gone.

Derek Windram: Diligent tip cleaning either with a Sal Ammoniac block or with the Multicore TipTinner is essential.

Chaz Smith: If a controller is used with a soldering iron, over-heating can cause the tip of the iron to burn out. A tip changes color as it heats from silver to yellow to purple. It should be regulated so as to never turn purple. Solder sticks to an iron and will transfer to your work when it is silver in color. Anything hotter than silver is oxidizing the tinning, and is really too hot. When you have finished

soldering, clean your tip, melt as much solder as it will hold, and turn off the iron. The extra solder protects the tip from oxidation. Sal ammoniac can help to tin the tip of a soldering iron. Melt/burn a hole in the block of sal ammoniac and get a bead of solder in the hole. Keep working the tip in the bead of molten solder until it adheres. Your best bet though, is to keep a clean iron, make sure it is well-tinned and don't overheat it.

Mike Barnes: The temperature control in the Weller 100 is via electromagnetic force. As the temperature changes, the magnetic field will change, moving a magnet inside the tip which allows more or less transfer of heat to the tip. You control the temperature by changing to a higher or lower rated tip. Using a rheostat with a Weller iron does nothing since the temperature is maintained by the tip.

Hexacon Electric Company: The tip is made of copper. The front part of the tip is iron plated and tinned with solder. The rest of the tip is nickel & chrome plated. If you do not keep a coating of solder on the tip, the solder will oxidize away and expose the iron plating which will also oxidize. The solder will not wet to the tip and will roll right off. It's what we call a "dewetted" tip. When that happens you may be able to revive the tip. You have to clean the oxidized iron plating so it will tin. Do not file the tip! You will wear through the iron plating. You can use our TS-10 tip scrubber, Scotch Brite, or very very fine emery (taking care on the sharp edges of the tip). Once the tip is clean, plug the iron in and as soon as the iron will melt solder, add solder and flux to the tip. Don't delay as the tip will oxidize again and you will have to start over.

LEAD FREE SOLDER

Patina is made to react to the lead in solder, so if you use lead free solder be aware that it does not take patina well. Another problem with using this lead free product is that there is a danger of cracking the glass while you are soldering, since more heat is required to run a satisfactory bead.

SOLDER NOT "TAKING"

Vic Seested wrote: "A month or so ago, I almost finished soldering a lamp, but lost interest in it with only a little left to do around the rim. I left it just as it was with the flux still on the lamp. Today, I got back to finishing the last of it, but the solder won't take. I've tried cleaning, scouring and chemically treating the area without luck. I'm at wit's end, so any suggestions?"

Jim Clark: Try a little 0000 steel wool.

Mike Barnes: Do what Jim recommended, but if you use steel wool from a hardware store be sure to clean the surface with isopropyl alcohol before fluxing and soldering since the wool has oil in it to keep it from rusting.

Mary Ritter: I recommend using bronze wool because it isn't oil-treated. When I use bronze wool, I dip it in a little flux. It seems the flux acts as a cleaning agent as well as a bonding agent.

Nikki O'Neill: What worked for me in this situation is steel wool and elbow grease, then use a much stronger flux - like oleic acid.

Chaz Smith: This is where CJ's comes in handy. If you clean what you've done with CJ's, you can let it sit for months before resuming work. You may be able to wet the foil down with flux and use a bit of a gentle scrubbing motion with your

iron to clean and get solder to stick.

GAPS & BRONZE WOOL

Wesley Wong: I've finished the major soldering of my lamp. In the final phase of cleanup, I noticed two problem areas in my lamp. On one glass piece next to the rim, the foil has pushed up off the glass – leaving a small gap between foil and glass. On the second piece, the foil worked itself off the edge of the glass and now there is a gap big enough to see to the inside of the lamp.

Kevin Hendon: These gaps don't have any structural bearing on the shade, so, for the gap at the rim, take the soldering iron and re-heat the area, while pushing down on the foil. If accumulated solder is an issue, try solder wick to remove the excess and try again. For any sort of gap, fill it with very fine threads of Bronzo. This is great stuff and can be sanded as well.

Mary Ritter: You might try a cosmetic fix on both those gaps by first giving the areas a very thorough cleaning so all the flux is removed. Then tape a piece of copper foil over the gap, extending it so it goes beyond the gap and lines up well with the existing foil edge. Burnish it down well, then tack it lightly on each end to make sure it stays in place. Solder over it, blending the new solder line in with the existing one. Now, as for brass wool (Bronzo); I'd heard that steel wool has an oil coating that prevents rusting, but oil could interfere with the patina. So, I initially used this product to scrub down solder lines. Since then, I've found it especially great for filling large gaps like under dragonfly wings. I've also substituted it for solder wick. Roll a small piece into a thin strip, soak it in flux and then poke it into the area of the solder that needs to be removed.

Ernie Downey: I buy solder wick at Radio Shack. It is called desoldering braid, but it is exactly the same thing.

SOLDERING DISCUSSION

Hap Webb: These are pretty basic questions that have been discussed before, I'm sure, but I'm just wondering what is working for others and if there is anything new. How do you position your large lamps when you solder the inside? Do you put a bead on the inside as well as the outside? And, do you use 50/50 to tin and then 40/60 to bead or...? Which solder do you like best and which flux works for you?

Lynne Salcetti: I use a lamp positioner to solder my lamps. After doing my very first one in my lap - nestled in several beach towels, I knew there had to be a better way! I solder but do not bead the inside and I use 60\40 solder. I prefer paste flux - used very sparingly. I use a 100 watt iron and wear a respirator when I solder the inside of the lamp.

Irwin Terry: At our Studio, we use Canfield 50/50 solder. We prefer Nokorode paste flux. I have tried water soluble fluxes and they were a nightmare. The inside of the shade sputtered and bubbled when soldering and the flux corroded the foil instantly on the inside of the shade before it was off the form. As for the inside of the shades, we smoothly solder the interiors of our lamps but do not put a full bead inside. There are few things that look less professional than looking inside a lamp and seeing lots of holes in the solder from air/flux bubbles. I clean my shades with odorless mineral spirits in a utility sink area with a vent fan, and always wear protective gloves and a facemask to help minimize chemical

exposure. Once the flux and wax are cleaned off the shade, we wash the shade with "original" Palmolive dish soap to clean it thoroughly. It works well for us.

Nancy Pimental: We bead solder the inside of the lamp as well as the outside. That enables us to bury our reinforcement wires inside, and it gives the lamp extra strength and a finished look. We like to use the Quik Set solder by Canfield for lamp soldering. It is a special 60/40 that sets up quickly, and with it, you can actually solder on "not so level" areas without it running.

Mike Barnes: I always use Classic 100 Jel Flux, and 60/40 solder without any sputtering or corrosion problems and it's easy to clean. I have occasionally used 50/50 to tin. I also finish my lamp on the inside just like the outside, as you would a good suit.

REINFORCING LAMPS

Jenny Hanley-Palmer: Strengthen the Lotus lamp by reinforcing it with 12-14 gauge wire. The wire should be installed vertically in four areas on the inside of the lamp and a horizontal wire should be soldered to the area directly above the flowers. The uneven bottom must also be reinforced. Solder well in the critical area at the top aperture where the glass meets the 2" ring.

Bonnie Eckert: I always add several reinforcement wires to the inside of large lamps. It's not a difficult job! Anticipate your curves and bend one length of the reinforcing wire into the shape you need before you solder it to the lead lines of the lamp. Be sure to start the wire 1/2 inch in at the aperture ring and then solder the wire in place. Follow the lead lines and tack the wire in place. Try to use the straightest pathway that you can find and be sure that the wire is only laying on the solder seams in your lamp. To complete the reinforcing, I connect the wire in 1/2 inch at the bottom rim. Your final soldering of the lamp is done after the lamp has been reinforced.

Alex Glassman: I use picture frame wire for reinforcement in my lamps. This wire is flexible, hardens well with solder and is inexpensive. Another nice thing is that this wire comes in different widths. I buy it in large spools from frame shops.

Joy and Audie Ammons: On larger shades (like the 25" Hydrangea) that are flimsy when only tinned or top-soldered, we reinforce with 20 gauge pre-tinned copper wire before we remove it from the mold. Following design lines, we run this wire around the shade and solder it in at the seams. After you've beaded the shade, this reinforcement doesn't show in the soldered seams. 20 gauge wire is what we use around the bottom of all shades with an uneven bottom.

SPECIAL CONSTRUCTING CONSIDERATIONS

FITTING GLASS, CROWN AND BRANCHES ONTO A MOLD

Bill Callow: Since the crown doesn't follow the lines on the mold of the Wisteria, here is the procedure he recommends to construct the lamp:

- Cut out the complete lamp using glass easels and a light table to check progress.
- Foil all the glass pieces that will not be in actual contact with the crown and attach them to the mold - hold off foiling the top pieces that will meet up against the crown.
- Tin the crown only around its edges and at areas where the glass pieces will be soldered to it.
- Place the crown on the mold before attaching the top glass pieces. Decide on the closest fit after trying it at all three sections around the mold and wax it in place.
- Do a "juggling act" with the top glass pieces as you try to fit them to their approximate places around the crown. Some grinding or recutting might be necessary.
- Foil these top pieces and wax them to the mold.
- Now, you can solder the lamp!
- Follow the branch areas that are shown on the pattern and make a mylar "window" (cutout) for these branches that extend down from the crown.
- Use wax to hold the "window" overlay to the lamp.
- Lay copper wire along the branch area that shows through the mylar "window". Temporarily, hold the wire in place with wax.
- Remove the window and solder the wire branches to the lamp. Build up and thicken the wire with more solder to achieve the look of a branch.

Lynne Salcetti: When I worked on the 10" Wisteria, I used rubber tipped pliers to CAREFULLY bend the branches down to fit the mold and used a rattail file to clean up some of the rough edges. This was done before I placed the glass on the mold. I've talked to others about working with the glass and crown, so in the end, I used a combination of several tips and did what was easiest for me. It was difficult to find the matching branches on the mold because some of them don't exist. That's where the re-fitting of the glass comes in. I cut those pieces down to fit between the branches. I've talked to others who cut them to fit under the branches, so you will have to make the choice.

DON'T TIN ODYSSEY'S CAPS, CROWNS OR BRANCHES

Carol Conti: Odyssey's caps are brass and are not to be tinned...brass will take whatever patina you apply. After patina has been applied to a cap, we sometimes get an even better color by using a torch to heat the patina. Using a torch to tin the ring is fine, but remember that the outside edge of the ring is the only part that should be tinned since that is the only area that will be soldered to your lamp's aperture. The torch could also be used to speed up the tinning of the bottom rim. Odyssey hardware and bases are exact replicas of Tiffany components. All cast parts are made from high-copper brass, just as Tiffany employed. Odyssey crowns are raw cast brass. The branches are cast in pure lead to allow for bending to fit the contour of the mold, so they may warp or melt

if soldered. If you apply solder only where it is necessary to the (copper) Spider Crown, the untainted (unsoldered) portion of the crown will take a lovely patina. These cast parts should only be tinned at the spots where they are to connect with your lamp's solder lines. The less you mess around with solder on these parts, the more likely you will be able to achieve that beautiful green/brown patina that will match your lampbase.

SPECIAL CONSIDERATIONS FOR COBWEB/APPLE BLOSSOM

Mike Barnes: Before cutting out the pattern pieces of the Cobweb/Appleblossom that border the branches, purchase the necessary cast branch work for this shade from Odyssey. For an exact fit, overcut the pattern pieces next to the castings, lay each pattern piece on the mold, position the casting and then draw the border line along the casting onto the pattern piece. After all your glass has been cut, attach each piece to the mold except for the border pieces. *Certain areas of the branches have cutouts for your glass inserts. The casting insert glass will have to be installed after the shade is released from the mold.* Next, do a check of the branches on the mold for fit and spacing and then tin the branches. To tin, I used a propane torch and liquid solder (which has its own flux). Using pliers to hold each branch, I applied heat, brushed on the solder and moved the solder around the edge - tinning everywhere the foiled glass would come in contact with a branch. (The copper plated branches are made of zinc, so don't hold the torch too long at any one place as it may melt the casting.) The next step is soldering. Not wanting a smooth solder line along the branches, I used a 100 watt iron and was able to achieve a realistically rough look. After getting the branch casting hot, I slowly moved the solder around the branch. Next, I tackled the gaps in the pattern that are meant to be branches. I filled these gaps with solder. To rough them up a bit, I used the corner of my iron and tapped it on these newly-soldered branches. Before applying patina to the completed the shade, I had it copper plated so that it would match the plating on branches.

SPECIAL CONSIDERATIONS FOR BRANCHES

Marie Jo Murray: In some Tiffany patterns that incorporate branches (ex: Wisteria, Grape, Trumpet Vine), the instructions tell us to fill in the branch area with cut pieces of glass that we've covered with foil so that solder can be layed over this glass. To me, this seemed to take too much time and effort, so for the very thin branches, I use copper wire as a filler. For larger branches, I found that lead and pieces of solder laid in the branch spaces would melt very fast and raise up, taking on the look of thickness that we see in branches. This is a nice way to use your scrap lead...it's a lot faster to cut lead than glass to fit those spaces. Also, it's hard to build up the solder on the glass pieces. Another idea is that if you have an air tool attachment for your Dremel, you can use it to make design lines in the soldered branches.

CONSTRUCTING THE TURTLEBACK SHADE

Carol Conti: Because of their thickness, the turtlebacks can't be installed until the lamp is off the mold. After soldering all the gridwork at the top and bottom of the lamp, the top ring and bottom rim are installed. Lengths of 8 gauge wire are tack-soldered vertically to the top and bottom gridwork crossing the center of each turtleback opening. These temporary bridging wires hold the top and bottom

gridwork securely in place as you release the lamp from the mold. Make a cardboard template of the opening where the turtlebacks will go. The template is your pattern that you follow to cut and fit each turtleback to its opening. After foiling the turtleback, remove one of the bridging wires and solder the turtleback in place. Continue - in sequence - removing the wires and adding the turtlebacks.

LIGHTING THE TURTLEBACK BASE

Don Conti: When using turtlebacks of the same color as those in the base, you can unify the whole lamp by placing a small light inside the base to give form and color to the beautiful large turtlebacks in the base. The bottom cover plate is removed and the lamp cord is removed. A second hole is drilled in the bottom cover and the cord is inserted through the new hole. The original hole is fitted with a 3/8" short nipple and a short hickey. A keyless socket is attached to the hickey using a short 3/8" nipple. A short length of lamp cord - 6" or so - is threaded through the hickey and connected to the socket. The other end of this cord is spliced to the main lamp cord using wire nuts. Now, the main cord is attached to an inside corner of the base in order to keep it from coming in contact with the bulb. Screw in a small bulb and replace the bottom cover plate. (A small light is the key - use a 10 or 15 watt bulb inside the base.) Affix a line switch to the lamp cord. Turn it on and enjoy a nicely unified base and shade.

SPECIAL CONSIDERATIONS FOR THE SPIDER LAMP

Carol Conti: Tin only the edge of the spider crown where the glass will meet the legs. This way you'll be able to get a magnificent greenish coppery patina on the crown. When I did this lamp, I learned that a wooden mallet comes in handy after you've failed to line up the copper crown's legs to the mold. Also, hold off cutting and trying to install the top smaller glass pieces between the legs until the end. I found it best to cut them to fit the crown rather than fitting the pattern.

SPECIAL CONSIDERATIONS FOR SOLDERING THE 22" DRAGONFLY

Peter Grotepass: About that problem of the 22" Dragonfly lower portion (which is under the "equator"), I would solve that problem the following way: 1. Don't solder a complete seam around the "equator". 2. Stabilize the lower portion with some wire cut from any metal coat hanger. Make sure that it is bent properly to follow the form of the lamp (ie. absolutely no tension on the wire) 3. Before heating up the mold, attach the lower section to the upper section by soldering some (minimum 3, maximum 5) connections to make some "bridges" across the "equator". Make the connections in the following way: Take a single electrical connector and solder it near the equator on a seam of the lower portion (cut the plastic off first). Open the screws and bend a small piece of wire so that it touches a seam of the upper portion when it is fixed with the connector's screws on the lower portion. Fix the short piece of wire in the area where it touches a seam in the upper portion by soldering it onto the seam. Try to get all wire end directions approximately parallel. Mark both upper and lower wires on 1 of your 5 interim bridges with red nail polish. 4. Now open all screws of the connectors and heat up the mold. What will happen first is that the lower portion will drop down. Leave it on the table where it is. Move the upper portion off the mold and put it upside down on the table. Clean the mold up and put it aside. Now take the lower portion of the lamp (with four hands!) and put it back

exactly in its old position by fitting all wire ends into their connectors. Tightening the screws at this point allows you to put the shade on a base to view it as it will ultimately look when lit. While soldering the "equator", remove all connectors and wire ends.

CHESTNUT DESIGN

Here's an idea that Paul Crist hoped you'd consider when building the 12" Chestnut shade. Solder wires along the veins of the leaves. This will allow you to bring the leaves up and off the surface of the mold so that they could be lined up. Paul even has a hole marked in the design where the wires could be joined together. He emphasizes that the leaves should definitely overlap each other. The leaves should have strong edges and are not meant to be beveled so that they'd "fit" the mold. As with all patterns, cut to match the reference copy...don't cut to fit the mold.

REINFORCING THE LABURNUM

Kevin Hendon: Because of the unique irregular border and undulating contour of the 22" Laburnum shade, its fragility should be of concern to us. In addition to a 12 gauge lower rim, use Odyssey's 12 gauge wire to run three vertical lines and one horizontal line to reinforce the inside of his Laburnum. The vertical wires cross the horizontal wire and continue on to connect with the border wire. The horizontal wire was run from three to five inches above the lowest point of the border. Now, the shade is sturdy and doesn't have the "play" in it like it did when it was removed from the mold.

FILIGREE

ATTACHING FILIGREE

Lynne Salcetti: When attaching filigree to the wings of the dragonfly lamp, I tack each filigree in two places on the glass wing and then put masking tape over the entire filigree, leaving the edges uncovered for soldering. This prevents any errant drops of solder from splashing on or under the filigree.

Nikki O'Neill: I found it worked well to pre-tin the filigree inside and out, making sure none of the little holes got plugged up with solder. Using lots of flux (or Action Tin) will help. I also tried to leave a little solder beaded up on the filigree to give it a better look. Once that was done, I scrubbed the filigree with CJ's and soldered the filigree edges to the foiled glass. I was careful when doing the final soldering to not get any solder onto the filigree, except where the edges met the glass. (Masking tape helped here.) Where the filigree meets the glass, I made a bead around the edges to give it a finished look.

Joni Tornwall: When I made the poppy lamp, I put the leaf filigree on the underside of the glass because I felt that this "suggested" leaf veins - as opposed to "screaming" leaf veins! I think the way to decide on which side to use would be to hold the glass in front of a light source and place the filigree on one side of the leaf glass and then on the other side. As far as patina goes...the next time I use filigree I will apply the patina onto the back side *before* I solder the filigree to the lamp. Not doing this with the poppy lamp, I ended up seeing a shiny silver reflection coming from the back side of the filigree. I tried to flood the lamp with patina so that it would flow under the back side of the filigree, but then I ended up having to put the lamp into my whirlpool tub in order to get all the patina and flux out from behind the filigree!"

Kevin Hendon: When I made the 14" dragonfly, I treated the filigree as a separate entity to the shade. The first thing I did was to "Action Tin" the wings and set them aside. *"Action Tin" is a liquid solder that you apply with a small torch.* Any residual tin that covered the holes was just flicked off with my finger. When it came time to attach the filigree, I made sure the shade was tinned and beaded except for the area of attachment. I took each filigree, placed it over its glass piece and fluxed only the area of attachment with a tiny bit of flux and raised the bead slightly at the point of attachment. This gave a nice effect! Cleaning and patina was applied using the same procedures. Use a toothbrush to give each filigree a gentle scrub.

Barb Grollo: Before I applied the filigree to my dragonfly lamp, I tinned the filigree, cleaned off the flux and patinated the back of the filigree while trying not to get too much patina on the front. Then I soldered the filigree to the wings, cleaned the lamp and applied patina to the whole lamp. After rinsing, I polished it. To clean in and around the filigree, I used old, soft bristle toothbrushes and then used medium bristle brushes around all the solder lines to clean away residue that was left from polishing.

Marci Hilt: I discovered that I could use canned pressurized air to get out bits of "stuff" and then "superclean" between the filigree and glass.

Peter Grotepass:

- Clean filigree with nail polish remover and a piece of cloth - there might be

some etching resist on either side that may interfere with perfect soldering.

- Use scissors to separate the “wings” and remove all the small “footbridges” from the edges. Do not remove the small circles at the ends of two of the wings.
- Put all the wings on your work surface and tin both sides, but don’t be concerned if the filigree starts moving in heated areas and the small holes get filled with solder.
- To remove the superfluous solder, hold one end of the filigree with pliers (or a wooden clothespin) and heat up the other end with your iron until the solder becomes fluid. Now, close your eyes and rap the pliers (holding the filigree) sharply on your work surface. Repeat this until your filigree is completely smooth and the holes have reappeared.
- Clean your filigree and the glass of the wings.
- Place the filigree on the wings. (The position of the small circles should be in the middle of the dragonfly’s body.)
- Before permanently soldering the filigree onto your dragonfly wings, attach each filigree to its underlying wing at only one small area to help determine and hold the correct position of all 4 filigrees. (You will probably have to make some compromises with the fit of the filigree to the glass. This is normal.)
- Finally, solder all filigree completely around their edges, but take care not to “fill up” the small holes of the filigree which cover the glass of your dragonfly wings.

FILLING GAPS BETWEEN WINGS & GLASS ON DRAGONFLY LAMPS

Tina Alexander: Big gaps, such as occur around the dragonfly wings should be plugged with wads of copper foil or fine bronze wool before soldering.

Alex Glassman: Since you need the solder to flow into and fill up the whole gap, turn the shade at different angles. Try covering the gap with foil first and then solder it. Also, try to balance the gap by having the fulcrum point at the center of the wing. This gives you smaller gaps at either end instead of a big gap at one end.

Derek Windram: Cut blanks from 1/2” lead came, fashion and shape them to fit under the wings, then solder it all.

Tracey Christianson: To save time and solder, bridge the gaps between wings and background pieces with wider copper strips. Use a sheet of copper foil (purchase it from Odyssey) and make strips that are the width of the protruding part of the wings. Run the strips along the edge of the wings. Since the wings protrude at an angle, you will have to taper the wider strips. Use wax to hold these strips in place. Do a quick tack solder to keep the strips in place. Use your burnishing tool and run it along the strips to make sure they are flush up against the pieces surrounding the wings. Once each strip is secured with solder, you can proceed to solder the rest of the piece in place.

Barb Grollo: To avoid the large gaps on my Dragonfly, I used a mold and slumped the wings!

Vic Seested: Recently, I was told that it was not necessary to tin the filigree if I planned to have a shade copper plated. This would certainly would be easier and would save some time.

Larry Cartales: It is correct that it is not necessary to tin filigree before plating, but you will find that the plated piece will have a much smoother look than the

rest of the shade. I prefer tinning first so that the pieces, whether filigree or cap, will end up with the same textured appearance as the solder lines of the shade.

Lynne Salcetti: I have been helping new member, **Cecil Gilcrease**, with the 22" monster Dragonfly. I explained how I make a bridge with the solder on the wings, placing long pieces of the unmelted solder, tacking it on one end and cutting it off at the other end with the iron, like a picket fence. After the wing is filled in, I carefully smooth out the whole thing with more solder. It works, but you have to be careful so it won't melt through. Cecil went home, and when I talked to him later, he had a new and improved way of filling in the wings. He simply used the braided flex wire in the same configuration. No more drip through or big holes to fill in. So simple, and it had been right in front of my nose. Another thing I learned from Cecil, was to ask my dentist for any broken or bent dental picks (stainless steel, so nothing sticks to them). They are great for pulling up foil that has gotten squished into the seams and for placing the braided wire into tight spaces. Actually, a hundred different uses. Thanks for the great tips, Cecil. You can teach an old dog new tricks!

FLEXIBLE BRAID

ATTACHING BRAID

John Herman: A flexible tinned copper wire braid 2 1/2mm in diameter is perfect for finishing off lamps with irregular borders. This flexible braid is available through the Worden Company. Braid should be installed on the lamp while it is still on the mold.

Lynne Salcetti: When I'm applying flexible braid to a shade I wish I had an extra hand! I use a variety of tools to nudge the braid in place - long tweezers, a hemostat and a dental probe to push the braid into deep inside curves. I also use my (thickly-gloved) other hand to squeeze the braid in a little arch as I drip solder along it to anchor it in place. Then I go back and make a nicely rounded bead.

RELEASING A LAMP FROM THE MOLD

RELEASE METHODS

Bill Geller: Over the years, I've found that, as I worked on a larger shade and was taking the shade off of the mold to solder the inside, the lamp would get "out of round" and become somewhat lopsided - even to some very limited extent. When I was fabricating the Pond Lily, which is 36" in diameter and only 8" deep, I was faced with the problem of removing a floppy shade from its mold and trying to keep it perfectly spherical. After soldering in the top ring and bottom rim, I came up with the idea to reinforce the shade even more, before releasing it, by tack-soldering two large brass rims around the circumference of the shade. I used large rims so that they would overlap the shade and form a "metal cage". When I took the shade off of the mold, it was cradled and was given stability and rigidity by this cage. At this point, I was able to solder the inside and not worry about ending up with a badly shaped shade. After completing the inside soldering, I used 14 gauge wire to solder in eight vertical reinforcing wires and two horizontal wires (following the design lines). As a consequence, when the shade was hung, it not only hung vertically perfect, but when you looked at the horizontal edge, there was only *one* line that you could see. I am sure that I did not reinvent the wheel, but for those who may be unaware of this technique, 45 it might be helpful.

Lynn Perry: If you've installed a wooden base in the bottom of the mold (for this procedure, go to "Fiberglass Molds") here are the steps to follow to release a shade. Turn the shade upside-down and rest it on something tall enough to lift the ring about 1/4" above the worktable and small enough to fit inside the ring. (Small blocks of wood or metal jar lids work well.) Through opposite holes in the wooden base, insert two 100 watt light bulbs that are installed in porcelain bases. Angle the bulbs toward the center of the lampshade and away from the inside of the mold to prevent heat damage. Secure the angled fixtures and connect one fixture to the other with heavy twine. Cover the mold completely with towels for insulation. Turn on the bulbs and monitor the shade until the glass and the mold are hot. Gently push down on the edge of the glass to loosen the shade. The shade will slide off the form when the wax has melted. (If the shade is getting too hot and will not release, turn off the bulbs to allow the heat to become more uniform.)

Carol Conti: The last time I released a lamp - using the kitchen oven, there was practically no wax left on either the inside of the lamp or on the mold. The secret is to forget that you left it in the oven! My oven was set at 150 degrees F and protected by a sheet of aluminum foil. The lamp was left for about an hour. I discovered that all the wax had dripped down to the aluminum foil that lay under the mold, so all I had to do was use paper towels to wipe down the lamp and mold.

Bob Plagmann: Since our kitchen oven isn't big enough to release a large lamp from its mold, I put it into a plastic trash bag. Holding the top of the bag slightly closed, I stick a hair dryer into the bag and heat the shade, moving the hot air all around it. When the shade is hot, I run a thin knife blade completely around the bottom edge, between the glass and the mold. Hold the mold upside down and

by pushing against the bottom edge of the mold, the shade will lift up and out.

Gene Price: I was frustrated when I attempted to release my lamp in our kitchen oven, so I placed it on top of my light table. (The light table is lit by four 60 watt bulbs.) Within an hour the 18" Peony was free from the mold.

Judy Thompson: Use a hot air popcorn popper to remove a lamp from its mold. It takes only 5 to 10 minutes for smaller lamps to release. For larger shades, cut a hole in a large box to allow the popper to sit on the floor and then place the mold on the box. This works great and doesn't affect the popper at all!

Bill Callow: An electric paint stripping gun (kind of like a big hot hair dryer) also works well in releasing large shades from Odyssey molds.

Frank Becker: Find a box, somewhat larger than the mold and shade. At one end, cut a hole 6"x6" in the side of the box. Put the mold and shade upside down in the box and close the lid. Use a small heater with a blower and blow hot air into the opening, but make sure not to blow the hot air directly on the shade. The trapped air is heated quickly so the shade will easily slide off the mold.

Joy and Audie Ammons: During a Missouri summer, we either set the shade outside in the sun for a few minutes, or set it inside a car - making sure to protect the car's upholstery from melting wax. Another method to use on smaller shades is to fill the mold with hot water and just wait until the wax warms. On larger shades, put the shade in the bathtub and fill the mold with hot water. (It doesn't hurt to add hot water to the tub, either.) In winter, we set the shade on top of the heater in our workshop for a few minutes.

Deb Sossi: It was recommended that I use Soy Release to clean up wax, so when we took the lamp out of the oven and released it, my husband put Soy Release on the form right away - while it was still warm and all the wax came off. There wasn't a sticky place on it. The following day after I soldered the inside of the lamp, I took paper towels and squirted the Soy Release onto them and cleaned the inside of the lamp. I kept squirting the Soy Release onto clean paper towels and it was amazing how all the wax came right off.

When I "built" the lamp, I did not paint the form with Tacky Wax. Instead, I placed "little balls" of wax under each piece of glass. Some of the larger pieces had 3 and 4 "balls" of wax under them. This also aided in raising and lowering pieces of glass in relation to the ones next to them. Soldering also melted some of the wax and I wiped it away when it was still warm so that I did not have huge amounts of wax built up in the final cleaning stage.

Joan Bengston: I'd be afraid of using kerosene to remove wax because of its combustibility. I use Acryli-clean wax and grease remover, a solvent used by auto body repairmen to prep the surface of a car before painting.

SB Anthony: Instead of using kerosene to remove wax from the inside of the lamp and from the mold, I use lamp oil. It has a pleasantly disgusting vanilla smell, too.

Marialyn Salts: "De Solv-it" removes wax from the completed lamp as well as hot kerosene does and is certainly safer to use.

Mary Ritter: I love Tacky Wax but hated trying to get rid of it after a shade was soldered and released. My solution: put a piece of tape on the back of each piece of glass, then put a small dab of wax on the tape. After you release your shade,

just flick off the tape/wax.

Barb Grollo: At the store where I teach, the owner, Pat Pecora warms up her large kiln when a student is planning to release a lamp. We just place the mold on top, and within 10 to 15 minutes you can lift it right off the mold. There is enough heat to just take paper towels and wipe most of the wax off. If it cools too quickly, you can always place it back for a few minutes to get some more off. I also keep paper towels handy, while soldering the inside of the lamp so I can wipe away excess wax.

I had some glass easels that had quite a bit of Tacky Wax left on them from previous projects, so I decided to try some "Oops" - that stuff they sell for removing dried up latex paint. The container reads "for grease, wax, crayon, etc" so I figured I'd try it. It took it right off.

Larry Cartales: We have taken 2 lamps off their molds in our kiln. First we lined the kiln with aluminum foil. then heated the lamp to 200 degrees and held it there for 10 minutes. The first lamp was a 14" Tulip - cut very well and soldered together very smoothly. After 10 minutes, the tacky wax had puddled around the base of the mold and the lamp lifted right off. The second one was the 16" Apple Blossom. It was not cut as well, so there were some gaps that the solder had run through. I think it must have stuck to the mold, because the lamp did not move after the first 10 minutes. We gave it another 10 minutes and still nothing, so we raised the temp to 275 for a third 10 minutes. That was plenty of heat, but the lamp still did not come off. By this time, I could tell it was not a problem with the wax, so we turned it over and with my grozing pliers I carefully pulled on the mold while Patti Curtin held the hot lamp in her gloved hands. It did come free and not surprisingly, there were big lumps of solder on the inside. I simply attributed the difficulty to beginner level workmanship. I am sure that the next lamp that student does will come off the mold easier.

Jim Burgess was concerned that his 26" Oriental Poppy would be too flimsy to work on if it was released from its mold before the rim and ring were installed. After completing the soldering on the outside, *he turned the mold and shade upside down*, put a heat lamp inside the mold and wrapped the shade with towels to keep in the heat. At this point, he experimented by waiting until the wax had melted just enough so that he could pull the mold up a little from the shade. This allowed him enough extra space at the bottom of the shade to attach the rim. After the rim was attached, *he turned the mold and shade right side up*. Since the mold was pulled farther down inside the shade, he was able to attach the top ring. With rim and ring installed, Jim did the complete release of the shade from the mold and was relieved to be able to solder the inside of his sturdy shade!

Marie Jo Murray: To release a lamp from its mold, I use a single burner that I place under the mold that sits on top of four blocks of wood. I lay newspaper below the mold to catch the melting wax. The burner is set on high for two minutes and then shut off. After five minutes, even my 28" lamp could be lifted off the mold. While the lamp and mold are still warm, I wipe off any excess wax. I also use the burner to melt animal glue when I make glue chip glass and to melt shoe polish that I use to "distress" picture frames. I bought the burner at a garage sale for \$1.00!

Pierre Leblond: For an easy solution to releasing a lamp from its mold, I simply fill the mold with very hot water from the tap and wait for about 5 minutes. I put on rubber gloves and then, by applying a gentle downward and twisting motion between the shade and mold, they easily come apart. While the mold is still warm, I can immediately wipe off what remains of the wax with paper towels.

Lynne Salcetti: After a lot of tugging and maneuvering to release shades, we found that if you flip it over on its ring side, you can just slide it up and out of the mold and not have any distortion of the shade. (I always solder the ring in while the shade is still on the mold, but I check the mold first with a level.)

JOINING SECTIONS AND RELEASING TUCKED SHADES

Nichole O'Neill: On the 22" (tucked) Peony I didn't pre-install the rim since it doesn't position well within the lamp-edge contour. (I did solder in the ring before releasing the lamp from the mold.) Leave an unsoldered seam around the widest circumference and leave three vertical seams open in the lower tucked portion. With the lamp in the right side up position, heat one lower section at a time with a heat gun (or high-powered hair dryer). The band pries off when hot - about 5 minutes. Repeat with the other two bands. Place the lamp upside down and rest the top of the mold (inside the ring) on a piece of wood. This allows the ring and shade to be suspended about 1/2" from your table. Cover the table with a piece of styrofoam to cradle the shade when it is released. Cover the mold opening with a piece of wood to keep the heat in and aim the nose of the heat gun to the inside. Put a towel around the heat gun to keep in the heat. The air intake should stay outside the mold. Re-position the heat gun occasionally to avoid hot spots. In several minutes, the lamp will be warm and can be pushed down off the mold.

Teresa Mesina and Valinda Gillis: Since tucked shades are released in two pieces from the mold, try installing the rim of 18" shades while the lamp is still on the mold. This reinforces the more flimsy lower portion of the lamp. After releasing the two sections, complete your bead soldering on the lower portion - both inside and out. Now, set the upper portion upside down on the worktable. Now, since the lower portion is sturdy, it is easier to place and hold it in position as you solder it to the main portion of the lamp.

Joy and Audie Ammons: When we remove shades with a tucked bottom - such as the 22" Peony, we apply strips of masking tape to several of the vertical seams that run from the widest point of the shade to the bottom. (These areas are found every 6 to 8 inches around the bottom.) The masking tape serves two purposes: it reminds us not to solder that seam and it keeps solder from dripping onto that seam. We solder the ring to the shade while it's still on the mold and then solder all exposed seams of the lamp. Once that is done, remove the masking tape, heat and "ease" the areas away from the mold and lift the shade off the mold. Turn the shade upside down and ease the areas back together. Solder the seams that were left open and then solder the rim to the bottom edge. The bottom wings and 'noses' of the 22" Dragonfly are slightly tucked. We solder on 3 or 3 1/2 repeats of wings before we remove the lamp from the mold. When heated, the lamp can be removed quite easily from the mold. Once it is off the mold, you have a good starting point and angle to add the rest of the wings and 'noses'. We also add the eyes at this time.

Deb Bowen: Much thought and caution must be taken when it comes to soldering a tucked shade. When it's time to release the two parts, pull the shade off the mold in two different sections after marking the top and bottom sections so you know exactly where they should line up. To mark the sections, I use a Sharpie and write in big numbers so that the number flows from the top section down into the bottom section. This way you can line up the numbers exactly - once the top section of glass comes up and off the top of the mold and the bottom section is released from the bottom of the mold. I add the rim to the bottom of the shade while it is still on the mold. The rim gives more support to the lower rows of glass. Make sure that you solder on the rim at a vertical seam so that you won't tear the foil.

Larry Cartales: Before fluxing and soldering the outside of a tucked shade, I have students wrap the seam (that they don't want to solder) with black electrical tape. It not only serves as a 'reminder', but it will keep any unwanted flux from getting on the foil and sucking solder onto that seam. The electrical tape comes off easily and does not disturb the foil. Hopefully, all foil was burnished well! Here is another tip: since the brass rim is thicker than the glass, I always have our students release the upper and lower sections of the lamp from the mold before attaching the rim. Yes, the lamp is a little flimsy, but you will be able to center the rim on the lower edge of glass. (We use old-fashioned wooden clothes pins to hold the rim in place. The rim might look too 'thick' before it is attached, but once in place, it gives the shade a beautifully smooth finished lower edge.

Pierre Leblond: Here are a few suggestions about tucked shades that I give my students:

- Start foiling the bottom row of glass pieces at a corner that is not facing outwards in order to avoid tearing the foil when the shade is released from the mold.
- To avoid getting solder between the two sections of a tucked shade, I just stuff the left-over backing of the foil into the gap. There is plenty around!
- To help my students decide on colors for their lamps, I use ASGLA calendars to show them photos of different interpretations of the same lamp.

INSTALLING & LEVELING THE RING & RIM

Paul Crist: Install and level the ring first. Remove any solder drips from the edge of the rim so the shade will sit flat on a table. Position the ring in the shade at the correct height and tack it in three places at joints approximately 120 degrees apart. For 2", 3" and 4" rings, the upper edge of the ring should protrude slightly above the outer surface of the lamp, so that the majority of the ring depth remains on the inside of the shade. For 5" and 6" rings, the glass should rest against the lower surface of the bead around the ring, with the long flange of the ring facing downward. Before completely soldering the ring into the shade, it should be checked for level. You will need a straight edge longer than the diameter of the shade and a ruler taller than the shade. Place the center of the straight edge across the top of the ring and measure its height above the table on both sides of the shade. Rotate the straight edge 90 degrees and repeat your measurements. If the difference in measurements is greater than 1/16", loosen the appropriate solder joint, raise or lower the ring, and reattach. Repeat your measurements and readjust until the difference is less than 1/16" in all directions. When you are satisfied that the ring is level, solder it into the shade all the way around, both outside and inside. Now the same must be done for the lower edge. Turn the shade over and place one end of the rim midway between two adjacent joints and solder it to the edge of the shade at the first joint. (Wooden clothespins are helpful to keep the loose rim in position.) Move down another 3" to 4" and attach it at another joint. Continue to attach at these intervals all the way around the shade until you can tell where the end of the rim should be trimmed off to meet flush with the other end. Use a hacksaw to cut off the excess. Attach the rim to itself. Place the shade right side up on a level surface and note where the rim raises up off the table. In the high areas, melt the solder attachment with your iron, push the rim down with a screw driver until it touches the table, and reattach the joint. Repeat this process until the entire rim is flush against the table. This will insure that your rim will be level. Now you can completely solder it onto the shade, both inside and out.

Chaz Smith: With the Odyssey System, the ring and rim can be installed while the shade is still on the mold. There is an indentation in the mold for the ring and on some shades the rim will fit on the mold just like another row of glass. Before tinning or attaching the ring and rim, clean them to a shine with Scotchbrite®. They must be perfectly clean in order for the solder to flow properly. My preference is not to tin the ring and rim before installation. These parts must be brought to the same temperature when they are being soldered onto the lamp, so I figure tinning them is just an extra step. Remember that heat is the key to stability. The brass must be hot enough for the solder to flow and end up looking shiny - not grainy. If the parts are not hot enough, you won't get a strong joint. I usually tack the ring in place at 3 spots while the lamp is still on the mold. After removing the lamp from the mold, I check to make sure that it is level. Then I turn the lamp upside down and add a few reinforcing wires. I run them an inch or so around the ring, then turn right angles and follow a lead line out and down the shade. (This step may not be necessary, but it makes me feel better!) I solder the ring from the inside, then flip it over and bead the outside. To trim the rim to the

proper length, I use a dremel with a cut-off wheel. I balance it on the edge of the shade with large paper clips or clothespins and tack solder it every couple of inches. Then I go back and tin and bead it. Rather than using a file, I try to use the heat to smooth everything out.

Mary Ritter: A problem I had while soldering the rim to a shade was trying to keep the rim from warping. (As careful as I was in cutting the glass, the fit of the bottom row would end up uneven.) With the lamp in an upside down position, I would solder the rim to that row of glass, but I tended to push down on the rim so that it would meet the glass surface. This resulted in an undulating appearance of the rim once the shade was on the base. With the shade in an upside-down position, my solution was to tack-solder the rim to the shade in just the spots where the glass touched the rim. Then I turned the shade right-side up on a totally flat surface and sweat-soldered onto the rim. No more warped look!

Kevin Hendon: I have always had trouble during the installation and soldering process to keep the rim level and worried about warping and all the other intricacies that might affect the rim. Now, I can offer you a tried and true installation that has worked on the last two lamps I've built. First of all, I hold the rim to the upside-down shade, but without attaching or soldering it to the shade itself. Once I've made sure it is the accurate size, I cut off the excess rim and solder the ends of the rim together to keep it in round. I then flip the shade over to its right side up and place the shade on the rim which lays flat on the table. (I find this method counters the usual instructions to "push" down the rim, if it is high at any point, in order to keep it flat on the table.) Soldering is easier now, since the solder tends to run down the shade to the rim, providing a nicely tacked joint.

Jerre Davidson: To level a ring, I was taught to use two metal squares, clamped together, to make an upside down 'U' shape. The joined squares are then placed on top of the ring with the legs hanging down on either side of the lamp. You then measure down each leg of the square to the bottom rim of the lamp to make sure the ring is level on either side. When it is even, tack solder the ring in place on those sides. Then, move the square around the lamp to check on other sections of the ring - adjusting as you go and tack soldering the ring at those sections. You can always loosen the tack solder if the ring appears to be uneven from another angle.

Joan Bengtson: Before attempting to level your ring, make sure that the table you set the shade on is level. *Trust me, I made that mistake before realizing that my workshop, which is in the basement, has a concrete floor that slants toward a drain in the furnace room.* To correct the problem, I used a piece of plywood that was larger in diameter than the shade and placed it onto the table. Using a carpenter's level, I shimmed it to make it sit level. Then I placed the shade on it and was able to properly level the ring.

USE HEAVY-DUTY IRON OR TIPS ON BRASS HARDWARE

Kevin Hendon: On my first lamp, I used a 100 watt iron and struggled to get the solder to adhere to the ring and rim without leaving the appearance of clumps. On my next lamp, I tried using a 200 watt iron on the brass parts and discovered the solder ran as smooth as silk! I didn't need to pre-tin the ring or rim since the

brass heats up quickly with the higher wattage iron. I use the Dremmel tool to smooth down the rim. The tool's attachments are useful for sanding and polishing.

Joy and Audie Ammons: We have found the easiest way to tin brass rims and the outside edge of rings is to use an 800 degree tip on a Weller 100 soldering iron. When you purchase a Weller iron, it comes with a 700 degree tip, but 800 degree tips are also available. To tin cast hardware, we use the liquid solder/torch method.

TIN RIM & RING WITH A PROPANE TORCH

Mike Barnes: Go over the brass parts to be tinned with steel wool. On a piece of 2'x2' plywood, nail in a horseshoe nail to hold the brass ring or rim. Place the hardware to be tinned on the nail. Flux it and apply heat with the torch. Remove the torch and apply liquid solder to the hardware using a flux brush. It also works to apply liquid solder to cold brass first, then heat it and spread out the liquid solder with the brush. I use Action Tin, a tinning paint made by Canfield. Take care, since there is always the possibility of the brush catching fire. By using the torch and liquid solder to prepare the ring and rim, it was easy to use the flat part of my soldering iron to fill the gap between glass and rim with a nice bead.

Joan Bengtson: When applying liquid solder, keep a clean dry rag at hand and while each section is still molten, wipe it quickly with the rag. Plumbers do this to prevent lumps and bumps. Like plumbers, I use Oatey brand #95 lead-free tinning paste.

IRONS & TIPS

Joan Bengtson: As for irons, I use a 100W iron with a 3/8" tip on a rheostat for general use. I have a variety of tip shapes but for beading on foil I prefer either a pyramid tip or a chisel tip rolled over on its side edge. I can melt the solder on the vertical flat surface of the chisel and it flows nicely into the bead. It's frustrating having to stop periodically to wait for the iron to heat up again, so for heavy duty work like tinning the cast brass lamp rings and rims, etc. and also for soldering foiled flat panel windows I use a 250W with a 1/2" chisel tip. It's kind of heavy but it holds the heat steadier than a smaller iron. I can work a lot faster with it. I keep it on the rheostat but I usually find myself setting it as hot as it will go.

HOLD RIM IN PLACE

John Schaefer: When it's time to solder the rim onto your shade, use wooden clothespins to hold your rim in place on the inverted lamp shade.

Pierre Leblond: I've been using masking tape for years as I've struggled to attach rims to shades. A few weeks ago, I used 24 small binder clips to hold the rim against the 48 pieces of border on the 20" Jonquil-Daffodil. I was able to mark precisely where to cut the rim. After cutting, I placed the rim back on with the clips and soldered between each one. Since the clips are just slightly wider than the rim, the rim ends up perfectly centered on the edge. It was very easy!

CUT AND SAND RIM WITH DREMEL TOOL

Jan Randa: Brass rims can be cut with precision with a Dremel variable speed tool with a cut-off wheel. I cut the rim before soldering it to the bottom of the shade using the cut off wheel. I sand one end of the rim flat and secure it to the bottom edge of the shade with clothespins. After I get all the way around the

shade, I line up the rim to fit and cut away the excess rim with the cut off wheel. Then I solder it in place.

Built-up solder on a rim and ring can be removed by using the sanding wheel attachment made for this tool.

VARIOUS TOOLS FOR FINISHING OFF A RIM

A Dremel tool, wet sandpaper, sanding block, electric triangular detail sander and/or a flat mill curve tooth file - w/o tang.

ATTACHING BALL CHAIN TO A RIM

Marialyn Prange: I attached the ball chain to the ceiling of my studio. (You'll want to suspend it via some wire and a hook so that it hangs straight down in front of you.) Also, it is helpful to anchor down the bottom of the chain so that it doesn't swing around while you are working on it. You might want to de-oxide it first using emery cloth. Flux the whole length of chain. Heat up either a heavy duty (150 watt) soldering iron or a propane torch - as I did. (You'll have to play around with the torch flame to get the solder to flow nicely - not too much blue flame and not too much yellow or you'll end up with a blackened ball chain!) I use a bit of old sheepskin to smooth out the solder as I am tinning. Starting at the top, begin tinning the beads. Gravity will keep all the beads properly separated and a little solder goes a long way. You want to carefully move that drop of solder down each bead. After heating up a short length, take your well-fluxed brush or wet wool-side sheepskin and brush/grasp the hot length of tinned beading and smooth the solder out - going from the top downwards. For the first half of the length of chain, I really made sure to cover everything, since I was not sure how exact the tinning process had to be. As I worked downwards, the second half was less than perfect - I didn't bother to cover all the dashes between the balls. It turned out that this didn't make the final soldering any more difficult. So, now that the whole length is tinned and smoothed with no extra solder between the balls, take the length down from its vertical position. What you have is a fairly straight, maybe even rigid piece of ball chain. The next phase is to get it to conform to the shape of the rim, so I took my mold and began to heat one end of the chain with the soldering iron - laying it against the mold. It easily started to conform to the circular edge. I turned the mold upside down on my lamp positioner in a horizontal position and used clothes pins to attach the chain as it conformed to the outside edge of the mold. What you should have after pinning the whole chain and letting it cool is going to be evenly-spaced, nicely tinned ball chain in the exact shape of the rim. Do not cut off the extra chain until after soldering the whole thing to the rim itself. Put your cleaned lamp back on the lamp positioner - in a horizontal position with the rim up and at eye level. I fluxed and made sure the rim had just a light tinning of solder before beginning. Start attaching the ball chain using a 100 watt iron. It will take very little solder to secure each ball. Use clothes pins to help attach and keep the chain in place as you go along. Finally, after you've gone around the whole rim, you can determine exactly where to cut the chain. Hopefully, the ending ball and beginning ball will have just the right amount of space between them. If not, cut and fit a little piece of tinned copper wire between the two balls.

Peter Grotepass: In our studio, we use two steps to attach the chain, but before soldering ball chain to the lamp's lower border edge, clean it up thoroughly.

Step One: Solder the ballchain in a horizontal position on the table by attaching every single ball to the rim with flux/solder. Assistance from another person will probably be necessary. While doing this, some spaces between the balls will inevitably be filled with solder, but at this point, don't be concerned. The important thing is that the balls are affixed in the correct position. Keep the chain spread so balls are soldered at the maximum distance possible from each other.

-O.OO-O.OOO is wrong, but O-O-O-O-O-O- is correct.

Step Two: This step is done in an upright position after the balls have been soldered to the lamp's rim. With your iron, slowly heat the chain - ball by ball. By doing this, superfluous solder will drop down onto the table or inside the shade. Unintended gaps between balls will open up again. We discovered that a small wooden stick helps keep the balls in the right position while they are heated by the iron. Place the stick behind the ball chain inside the shade while you solder on the outside. Proceed ball by ball, but do not use any additional solder. Make sure that the area in which you are running the existing solder is no larger than the space of three or four balls. Otherwise, you'll be unable to control the wooden stick and the balls might fall into the shade. To join the beginning and end of the chain, use the wooden stick to attach the last ball and the first ball together at the same time.

REMOVING A BROKEN PIECE IN A LAMP

Chaz Smith: Remove as much solder as possible around the broken piece so that you can pry up all the foil surrounding the broken piece of glass, but not the foil around the adjacent pieces. With your cutter, make scores upon the broken piece in many directions. You might even score and break more once the first cracks are made - anything you do to break it up will make it easier to remove. Lay a big soldering iron on the broken piece and let the heat run the scores. Carefully remove the broken pieces and use your soldering iron to melt away the solder. Use tweezers to pull away the old foil, being careful not to disturb the foil on the adjacent pieces. Cut a replacement piece, grind to fit, foil and solder it in place.

Mike Barnes: Walt Boepple used a piece of aluminum can and his iron to free a broken piece of glass. Since I needed something with more body to it to "unsolder" pieces in my latest project, I discovered that my Exacto knife was the perfect answer. I placed the soldering iron (point down on the soldered foil) and followed it with the knife...moving both along the soldered area. Task accomplished!

Bill Callow: Carefully use an airhose to blow out excess solder when removing a broken piece from your finished lamp.

SB Anthony: Walt Boepple taught this to me. Cut the can into strips about 1/2"x2" - large enough to hold onto, but small enough to insinuate into the seam. So that there is a minimum of solder to work with, melt away and let drip through as much solder as possible. Flux the area, then heat the solder until it's liquid. Slip the edge or corner of a strip of the can into the molten solder. Move your iron along the seam and wiggle the strip farther into the melted solder until it is completely between the two pieces of glass. You might have to use more than one strip. The aluminum keeps the solder from re-attaching as you move along. This method is not always easy, but in the end it does less damage to the work.

Walt Makos wrote: Use a solder wick (braided copper strip) or a solder sucker. Get the solder area hot to the point of melting and then use this tube to suck up the solder. Both can be purchased at an electronic store.

CLEANING THE SOLDERED LAMP

CLEAN-UP METHODS

Paul Crist: After soldering is completed, the shade must be cleaned to remove all traces of wax and flux. Warm (not hot!) kerosene does an efficient job. Use a small scrub brush to apply it, going over the shade several times. Next apply a chlorinated cleanser (Comet, Ajaz, etc.) with water and scrub thoroughly. The cleanser contains pumice, which imparts a “tooth” to the metal, making it more receptive to the patina.

Dave Hammond: After I've completed soldering my lamp, I use a combination of methods to clean it up. First, I dust and spread whiting on the shade, just as if it were a lead panel. Next, I use an acid remover, like CJ's and just for good measure, I rub a paste of baking soda and water over the project and let it dry. Finally, the shade is washed, rinsed and dried off. Now, the shade is ready to take the patina.

Ernie Downey: Since I've used baking soda to clean up my lamps, I haven't had a problem with that dreaded white residue. After I wash a lamp with soapy water, I sprinkle sections of the wet lamp with baking soda and use a small scrub brush to really work in and around, up and down and back and forth over the solder lines. After repeating this 2 or 3 times on each section, I use a sponge and water and rinse the lamp clean.

Joan Bengtson: Here is a unique cleaning tip that I copied from a program on HGTV that showed an artist cleaning her glass in order to prepare it for accepting gold leaf. This concoction will work for us, too - especially after we've soldered a lamp. It is simply a mix of ordinary rubbing alcohol and whiting. This mixture had a very liquid appearance. It was applied with a soft cloth or sponge. No rinsing was necessary and a soft dry cloth was used to dry and polish.

Joe Porcelli: Oxidation is the villain of patina. Oxidized pieces yield unpredictable results - everyone is familiar with white, chalky, powdery oxidation that appears on solder lines. It is best to patina right after soldering, but if you can't apply the patina, the clean and dry lamp should be placed in a plastic bag to protect it. If the solder is only lightly oxidized, clean it off with 0000 steel wool; otherwise a chemical cleaner such as Jax Metal Cleaner® will have to be used.

Donna Brewer: In order to clean my lamps outside when the weather is nice, my husband checked at Home Depot for a large, shallow, inexpensive plastic tub for me to use. He found a cement mixing tub, made of plastic that cost about \$10! I am able to easily scrub a lamp clean and, since the tub is plastic, I don't worry about damaging the lamp.

FILING THE RIM AND RING

Paul Crist: After your shade has been cleaned, the rim and ring are filed to remove any excess solder. A single-cut file is preferable, because it will not load up with solder as easily as a double-cut file. The lower third of the rim should be filed down to the brass and the edge blended into the bead. The top of the ring should also be filed down to the brass and the inside and lower surface of the ring completely cleaned of any solder. All filed surfaces are then sanded with 120 grit emery paper to remove any file marks and smooth the surface. This can be followed by 200 grit if you want it to be very smooth.

PATINA

Joe Porcelli: *lecture notes by Lynne Salcetti*

Metals: How patina adheres to the metal depends on where the metal stands on the scale of metal integrity. The scale is as follows: lead, tin, brass, copper, and finally, the best of all - bronze, an alloy of copper and tin. You run into problems when you use different metals in one project. Each metal accepts patina in a different way and so it is impossible to make the patina uniform.

Cleaning: The golden rule of patina: any metal finish reflects the quality and condition of the metal underneath. Contaminants will be reflected in the quality of your patina. Rinsing is necessary after any cleaning procedure otherwise you will have unpredictable results. Fine steel wool (000) is best to use on oxidized lamps, it won't scratch the lead. Immediately apply the patina after the lamp is clean.

Electroplating: The best way to avoid the mixed metal problem is to have the finished lamp electroplated with a hot-cold copper process. To find a good electroplater, check with local antique dealers. When you talk to an electroplater, make sure that he has worked with glass and metal combinations and let him know that you plan to add chemicals to the electroplating. Specify 4 mils. of thickness. Request instructions on how he wants you to prepare the piece. (There probably won't be any instructions, because of their preliminary acid bath.) The charge is usually based on how long the piece is in the tank and how many pieces can be fitted in the tank. The duration of the procedure is usually 45 minutes and should cost between \$35-\$50. The result should look like a dull copper penny.

Materials: To solder your lamp, use Canfield or Gauthier solder (less impurities) and water soluble flux. Do 2 applications of patina, especially with copper. Use Simichrome polish for finishing. Do not use Simichrome polish on lamps with black patina since this polish will remove the patina. (If black patina flakes, dilute it with a small amount of water.) Use 2 coats of polishing wax on black patina, such as Minwax® to obtain a dark finish. Finish off by buffing.

Brass finials and caps: Don't solder brass finials and caps. (Brass takes patina better than tin/lead.) Steel wool first, then dampen a paper towel with patina and apply in a circular motion. It will gradually become darker and more lustrous. This takes 2-3 minutes. If you have spotty areas, steel wool it again and reapply. Apply Simichrome.

Finishing an electroplated copper lamp: Clean lightly with fine steel wool, inside and out. Rinse and allow to dry. Mix 1 tsp. clear white vinegar with 8 oz. Jax green patina. Dip brush or rag into mixture and apply to the lamp. The patina will turn brown. Let it sit 10-15 minutes and the green will begin to appear. (If humidity is high, it might take 30 minutes.) If it doesn't look green enough, apply a second coat. If you have a patch not taking, use steel wool on it and reapply. If you've done it properly, the patina shouldn't come off if you swipe it with your thumb. (How much green you allow to appear is a personal decision.) Finally, rinse the piece to stop reaction and blot dry.

Finishing a lamp that hasn't been electroplated: You'll need 3 Jax chemicals: 1. Copper plating solution (not copper sulfate) 2. Brown darkener #. Green patina.

You'll need 3 application brushes, each marked copper, brown and green. The chemicals must not be mixed; if they are, the result will be splotchy and peach-colored.

1st application: Brush on Copper plating solution and let it set for 2-3 minutes. Rinse and blot dry. Use steel wool to completely remove the solution. Rinse and blot dry.

2nd application: Apply 2nd coat of copper solution. It should look like a bright shiny penny. Solution always takes better on the 2nd application. Remove any blotches with steel wool and redo. Rinse and blot dry.

3rd application: Brush on a small amount of Brown darkener with a new brush. You will not have an immediate reaction, so wait 5-10 minutes. It should take on a deep leather brown look. Rinse and pat dry.

4th application: Use a new brush and apply the Green patina to the dry lamp. Nothing will happen for 15 minutes and it may take up to 45 minutes. If you want more green, apply a 2nd coat, but don't rinse between green applications. (As you apply the 2nd coat, it will look like you removed the 1st coat, but the color will come up as it dries.) Rinse the lamp. Dry the lamp - but since the green is very fragile, use a hair dryer or very light patting until it's dry.

5th application: Lacquer and wax. Lacquer comes in gloss, satin (low luster) and matte (dull finish). Buy spray cans of Kryon or Dupont Color Works. (Whether you use satin or gloss is a personal preference. Matte lacquer looks especially good on Oceana glass.) The lamp must be totally dry. Hold spray can 6-10" away and cover the lamp, inside and out, with a very thin coat. When the lamp is dry, apply another very light coat. After the second coat is dry, apply a coat of GlassWax.

Joe Jewel of Paul Crist Studios: *notes by Nikki O'Neill*

After much experimentation, it was found that the look of patina can be influenced by the humidity temperature and water in your area. Joe dissolves chemicals in de-ionized water but rinses in tap water to get the yellowing from chlorine. He suggests trying the M20 and M30 chemicals.

Procedure used at Paul Crist Studios:

1. Clean the shade with dichloroethylene dissolved in warm water.
 2. Acid bath.
 3. Cyanide bath - approximately one hour for copper plating.
 4. Apply desired patina solutions. Joe applies several coats of patina to the lamp, scrubbing it off between coats. Use Saran Wrap to cover the lamp in order to keep the patina working.
 5. Clean the shade thoroughly.
 6. Apply a satin finish Lacquer. This finish is between clear and matt. (Lacquering a lamp is a personal choice.)
 7. Wax with brown/black shoe polish using a large bristle brush. (Do only one-third to one-fourth section of the lamp at one time and then wipe off the wax.) To seal the patina and shine the lamp, polish with a clear paste floor wax. The wax removes the brown from the glass but leaves a nice color to the lead lines.
- If you want your lamp to look even older, sprinkle on vacuum dust!
 - Whitish deposits on the solder of your lamp come from the adhesive on the foil.

Joe recommends using hand-cut foil that uses Tacky Wax® as the adhesive.

- The sun will darken a patina.

Roger Weiss: In my first effort to get a green patina to take, I followed the directions to the letter, using Jax copper (2 applications, first application scrubbed off with steel wool), Jax brown and then Jax green. The results were not good but I noted that the patina seemed to “take” better on the inside of the lamp. I theorized at the time that the result must be dependent on the rate at which the green dried. Last year, I made a 14” Dragonfly and decided to try the green patina again. Once again, I followed directions closely, but after I applied the Jax green, I put the lamp in a deep plastic tub and covered over the top with a cloth to limit air access. When I checked the next day, I was pleased to see the extent to which the green had “taken” - both inside the lamp and outside. I lightly buffed the lines and applied a second coat of green; I placed the lamp back in the tub and covered it again. The next day I removed the lamp from the tub and discovered that the green patina completely covered all the solder lines and filigree. There was little, if any, grayish residue and the green patina was dense and very resistant to the touch. I cleaned and waxed the lamp and the final result was much better than I had ever hoped for!

Genevieve Berthet: You can get a green and bronze patina without having your lamp plated. The secret is baking soda! After soldering is completed, thoroughly scrub your lamp clean. Make a light paste of baking soda and water, apply it to the lamp and let it sit overnight. After rinsing off the paste, alternately apply both copper and black patina for wonderful results.

COPPER PATINA

Alex Glassman: To get a very shiny copper patina, clean off the flux, after you’ve completed soldering, and put on Kem o Pro. Buff the lamp and then apply the copper patina. Do a final buff.

BROWN PATINA

MJ Murray: To achieve a dark brown patina, apply black patina to the lamp with a sponge, rubbing the solder lines with fine steel wool until the solder becomes a pewter color. Rinse the lamp, but don’t dry it. Rub the solder lines again with the same unrinsed sponge and then rinse thoroughly.

Tracey Christianson: Apply copper patina and then rinse and dry the lamp. Scrub lightly with fine steel wool and then repeat this procedure. Apply the black patina, but only leave this patina on for a minute and then rinse.

Deb Sossi: I start out by putting copper patina into a plastic dish. I dip a soft rag into the dish and go over each solder line on the inside of the shade. Once that was finished, I took a wet rag and wiped the patina down in order to slow the action of the chemical. After patinating the outside, I took the shade outside and rinsed it off with a garden hose. (To hold the shade steady while it was being rinsed, I laid a towel over a large garbage can lid and placed the shade on it.) I repeated the entire patinating procedure, but this time I used black patina. After the rinsing step, I dried the lamp with a soft towel and let it air dry for an hour. I used Kem-O-Pro Finishing Compound to polish the shade and then let it set for another hour. After buffing with a clean soft rag, I used a Q tip to clean around the smaller areas.

RE-PATINATING

Twyla Morgan: Once I ordered a base through the mail but was very disappointed because it looked too green. To solve the problem, I took very, very fine sandpaper and got a lot of it off - being very careful not to sand through to the shiny metal. Then I just plastered it with brown shoe polish, let it dry and then buffed it. I was quite pleased with the end result.

Chaz Smith: Sometimes laquer has been applied to a base to protect the green of the patina. If that's the case, I'd be hesitant to remove laquer in order to remove excessive green. Try spray painting the base from a far distance or spatter brush it with bronze paint. I've had good luck painting and patinating a white metal base with bronze paint, patina and sealer that I purchased at an art store.

Nikki O'Neill: Joe Jewel, who among other things, repairs lamps and lamp bases for Odyssey, often uses (brown or green) shoe polish to "tone up" the patina.

Marie Jo Murray: Brown shoe polish is easy to find, but there is a green (cream shoe polish) that can only be found in stores that sell cowboy boots. Another good product that comes in small tubes of any color is "Rub On". It stays on well and is mainly used on picture frames.

POLISHING HINTS

Joan Bengtson: The polishing method that works for me is to apply Kem-O-Pro fairly sparingly with cottonballs, but don't let it dry before brushing it in. I use a big old soft shoe brush, first brushing in circles to get into the edges and then spread out the polish using long brush strokes. After the polish has dried to a haze I buff it thoroughly with the brush again. Be aware that Kem-O-Pro will remove patina if it's brushed too vigorously or too soon after applying the chemicals. Waiting a day or two to let the patina set will give better polishing results.

Barb Grollo: To get into grooves, when I'm cleaning or polishing textured glass, I use old toothbrushes. For easy use, I've transferred the polish, Kem-O-Pro, into a spray bottle. I bought a 12 pack of heavy duty cloth diapers and use them for polishing since they do a great job and don't get caught in the crevices like terry cloth does.

Eric Scott was not pleased with the appearance of his finished lamp after applying a coat of lacquer. (The glass looked like plastic!) **Paul Crist** responded that we should simply wax the shade with cordovan (or dark brown) shoe polish - the residue collects against the solder lines and adds to the look of the patina.

Jennifer Buckner: To help you polish your completed lamp, try a dremel tool with a small bristle brush attachment to get into those tiny areas that you can't reach by hand and takes a lot less "elbow grease" to polish a large lamp. A good product to use for polishing is Giraffe Joos. It helps reduce the residue that builds up along solder lines.

Nikki O'Neill: If you happen to have a circular sander, you might try a lamb's wool polishing bonnet attachment to polish your lamp. It will reach inside tight corners and saves on q-tips and elbow grease.

“DETAILING” A COMPLETED LAMP

John Baker: After a lamp project is “completed”, I like to put it on a base, light it up and view it for the first time...up close and personal. Since no one is perfect (on the first try anyway), I get my stuff ready to DETAIL my lamp.

1. Use multiple toothpicks to clean out any missed wax. They don't scratch the lead and are cheap! Usually wax and flux show up in tight cracks of leading. Also use toothpicks to dig out any buried BB's of solder hidden in the many crevases.
2. Use an exacto knife with a new blade to trim off any “overlaps” of copper foil. With a carefully placed cut, you can even up most of them. You can also use the knife to trim off the worst “split edges” of foil where it was forced to curve more than it wanted. When done properly, it looks like you foiled it right the first time.
3. Look for any leaded seams that didn't take a good patina. (My favorite stuff is copper sulfate solution which has aged for several days with lots of contaminates.) I use a fine wire brass bristle brush which is soaked in a hot batch of the patina. By carefully brushing the troublesome areas, the brush scrapes off the offending crud and allows the patina to “take” - all in one step.
4. After a thorough washing and drying, I re-examine for other flaws while it's on the lighted lamp base. If satisfied, sit back and enjoy the view; otherwise, back to step one.
5. Use brown shoe polish on the patina after it has aged for about a week.

SPECIAL APPLICATIONS

MAKE YOUR OWN JEWELS

With so much great glass on the market, it's a shame to have to rely on manufactured jewels that are either the wrong color, or just plain blah. Find some glass that will enhance the mystery and excitement of your lamp and experiment.

Lora Dill and Taeko Hirose: Make your own jewels by cutting 2 same-size layers of G.N.A. glass circles for each jewel...one circle with color and the other circle clear. Use the colored G.N.A. for the top layer and clear G.N.A. on the bottom. If a very light color is chosen for the jewel, use this color for both layers. Your fusing will be successful when you use clear G.N.A. for the bottom layer with other manufactured glass for the top color circle. Since the glass will spread out during firing, the glass circles are cut slightly smaller than the final size you want. Use a small table-top kiln and brush the kiln brick with glass release and use "Spray A" on the top layer of the glass circles. Check the progress of your fusing when the kiln reaches between 1400 and 1500 degrees. Always use clean glass. Try melting only one color in the kiln at a time, since fusing time varies with color. You could use Elmer's glue to hold glass pieces together, but apply it only around the edges of the pieces to be fused. Bullseye's Cranberry glass makes beautiful jewels!

Nikki O'Neill: To produce jewels, Tiffany pressed molten glass into brass molds and used a kiln to anneal. I'm sure he used a furnace to get molten glass, but I just use a torch and kiln for annealing. I heat and melt the ends of two rods of glass (same or different colors) in the torch until the mass is about right, take the blob out of the fire for a few seconds to get a "skin" and to be able to handle it easier and then I plop the molten glass into the mold and press. After a second or two, I take the glass (still attached to one of the rods) out of the mold and torch off the chill marks. I cool the glass in the flame a little, clip off the rod attachment punty, and let the jewel fall on a very hot hotplate. Then I pick it up with warmed forceps and place it in a hot kiln to anneal. You can make jewels from any rods that you have, just don't mix COE's. To make glass leaves, use a two sided press or "masher" with ridges to make the veins. I have an oval shaped leaf press. Both halves of the press match up and are welded onto the jaws of a pair of pliers. By pulling and flattening, I make the rough shape of the leaf at the torch on a punty. To make smaller leaves, I use a longer-than-wider slightly twisted mold which is tapered at the tip and more heart-shaped at the top. While moldable hot, position the glass in the mold and quickly clamp down. Hold for a second or two and then release. The veins are now present and the glass can be shaped more if needed.

A QUICK COEFFICIENT OF EXPANSION (COE) FUSING LESSON

Patti Curtin: All glass manufacturers have their own formula for making glass. For that reason, not all glasses are compatible. Bullseye and Uroboros both make a line of glass that is tested compatible at 90 COE. Uroboros and Spectrum both make a line of glass that is tested compatible at 96 COE. When the manufacturer tests it, they are allowed to be .5 COE off. However, if you have glass tested compatible at 90 COE and one glass is actually 89.5 and a second that's 90.5 you may still end up with breakage because of incompatibility.

Certain companies have many colors in their palette that may be compatible - for instance, GNA colors are compatible. Kokomo also has many colors in the 96 COE range. If you want to make something like a snowflake, you could use the same sheet of white since all glass is compatible within its own sheet. However, another run of white, by the same manufacturer, but made later the same day, may not be compatible with what they produced earlier in the day. Bottom line: testing and checking with polarization will assure you of compatibility.

FUSING IRIDESCENT GLASS

Stephanie Braman: When fusing iridescent glass, here is a trick to help maintain the iridized coating and also give the finished piece a deeper look. This requires two pieces of glass - one iridized and the other cathedral. Cut out your pattern piece from each of the glasses, then lay one atop the other with the iridized coating facing the cathedral glass. Proceed to do a full fuse. (It's best to fuse at a lower temperature over a longer period of time in order to reduce the chance of the coating burning off.) What happens is the coating is trapped between the glasses. If you are using a textured iridescent, the iridized pattern will turn out very 3D looking.

SLUMPING

Merle Jones & Don Conti: Purchase fire bricks from a pottery supply outlet. Make a cardboard template based on the angle of the lamp mold where you want to add slumped pieces. Carve and then sand the brick to match the contour of the template. Lay the glass piece to be slumped upside down on the prepared fire brick and fire it. The Quick Start Kiln is ideal for small slumping jobs and is reasonably priced. (Run a test to insure that the glass you want to use in slumping will retain its color.) There is no need to anneal these small pieces...pull them right out of the kiln as soon as the slumping is done to your satisfaction.

Chuck Berets: Warm the mold before you fire the glass. It needs to be at a saturated 200 degrees F so there won't be any kiln shock. The slump will start at 1100 degrees. If you see a color change in your glass, slow down the slump by firing more slowly. Glass just removed from the kiln can be cooled in a covered container filled with vermiculite.

Pat Pecora & Barbara Grollo: Use a fiberblanket with fiber mold hardener called Moist Pack® to slump glass:

- Cut a piece of the blanket a few inches larger in all directions than the area in which you are slumping pieces to fit.
- Press the material inside the area you're planning to slump, smoothing as much as possible.
- Leave it place to air dry for 2 to 3 days - enough to harden for handling.
- Fire it in the kiln to at least 50 degrees above the temperature you will need for slumping (1300 to 1350 degrees F) since the glass should slump at about 1250 degrees F.
- When it has cooled, three coats of kiln wash should be applied to the mold. (There seems to be no need to re-coat the mold between firings; that seems to cause the material to break down quicker.) Use in a well-ventilated area since it contains ether.

HOW TO MAKE A SLUMPING MOLD

Walt Boepple: At our last meeting, Joan Luckhurst showed her method of making a slumping mold so that she could slump some glass for her new lamp. Joan went to a local pharmacy and got a small box of gauze that is filled with plaster of paris in the webbing. She placed the piece of gauze in water, removed it and placed it over her mold. After it hardened, she had made a perfect mold of her mold! Now the new mold was ready to be filled with mold mix. When set up, this is what she used as her slumping mold to hold the glass. With this method, you don't have to put the mold mix on your mold.

MAKE YOUR OWN LAMP MOLD

Diana Springer: I make my own molds from Styrofoam and carve them to the shapes I want.

Alex Glassman: I went to a restaurant supply store and bought a 24" wok. The wok had the right shape for a hanging lamp and because it didn't have a great curve, longer pieces of glass could be used in its design.

This shade is on the cover of our 1998 calendar.

Barry Richters: Just because you receive a request to make a lamp with an unusual shape, is no reason to back off. The last 6 lamps I've made were selected from books and even from our own calendar after a customer says, "I want one something like that, only a bit smaller, or flatter." My next move is to draw a side profile of the lamp on a metal sheet, then cut out the shape with tinsnips. I make the mould out of a solid block of styrene foam. If necessary, layers of styrene can be glued together with a water-based wood glue to produce a solid block the same height as the shade.

(as you reduce the block to the desired shape, be aware that you'll have a snow storm!) Having marked the diameter of the lamp on the block, I trim outside the perimeter of the circle with a handsaw. Using the internal portion of the metal profile (pattern) as a guide, I whittle and rasp away the styrene until the metal profile fits over the mould on all sides. Then I give the mould a coat of sealant paint. After it dries, I cover it with masking tape. The design is drawn on the taped mould. After the lamp has been constructed, the masking tape can be removed or painted over, so a new design can be drawn. Being an ex-sheetmetal worker, I draw on my pattern making experience and use sheetmetal to make some of my moulds. However, these shapes are limited to cones and multi-sided flat section shades. I still cover these moulds with masking tape and draw on the lamp design.

MAKE A MOLD FROM A PHOTO

Chaz Smith: Since the pattern for Tiffany's Butterfly lamp wasn't available, I decided to reproduce the mold and design on my own. I found photos in the Neustadt and Duncan books. Even though I wasn't able to find a complete photo of one repeat, I was able to come close enough so that I could fill in the repeat.

Materials: • photo of lamp (straight on view of one side) • dimensions of lamp - ring size, diameter and height • photocopier - to enlarge or reduce the photo • opaque projector
• 1/4" plywood or cardboard - to cut out profile of half of the lamp • styrofoam insulation sheet - enough to cut circles the diameter of the lamp and stack to the

height of the lamp • glue for styrofoam (I used wood glue) • 1/4" plywood - 12"x12" • motor with buffing wheel attachment • double sided tape (such as carpet tape) • saw, sandpaper, ruler and marking pen • clear packing tape • safety glasses

Procedure:

1. Enlarge photo of lamp to size you want it to be. (I taped several sheets together to obtain the complete image.)
2. Cut out this image, fold it in half and trace this half onto 1/4" plywood or cardboard. (This profile will be used to form the styrofoam, so be exact.)
3. Cut rough circles of styrofoam insulation that are about an inch larger than the diameter of the shade.
4. Glue the circles together to form a stack that is somewhat higher than the shade height and allow the glue to dry.
5. Drill a hole in the center of the 12"x12" piece of plywood so that it can be mounted on the buffer arbor. This piece may be cut round and should be made smaller than the lower rim on the lamp.
6. Mount plywood/arbor combination to the bottom of the styrofoam stack with double sided tape - being careful to center it. (You may need to drill a hole in the styrofoam for the arbor protrusion.)
7. Mount the arbor on the motor. (If you have a foot switch control, use it to power the motor; otherwise, get a friend to switch the power on and off.) Take this assembly outside, as this gets very messy.
8. Put on safety glasses and briefly apply power to the motor so that the styrofoam plug starts to spin. (I kept giving it short bursts - never getting up to full speed.)
9. Use the saw and begin forming the plug. Hold the saw horizontally and work slowly so as not to break it off the arbor and turn the plug down to the diameter of the lamp.
10. Turn the styrofoam plug to the shape of the lamp by using the plywood (or cardboard) profile as a guide.
11. Sand briefly with coarse sandpaper.
12. Remove the lamp mold from the arbor and take a shower to get those cursed little white things out of your hair.
13. Use the opaque projector to shine the image of the photo onto the styrofoam lamp mold. Be sure the mold is level and square to the projector. (You may need to enlarge or reduce the photo image so that it can be projected correctly onto your mold.)
14. With a marking pen, trace the pattern lines onto the mold. You may need to change focus for different areas. (My lamp had three repeats, so I picked one repeat and then made sure they were spaced at equal thirds around the mold...the rest into place.)
15. After the image is traced onto the mold to your satisfaction, cover it with clear packing tape to protect the mold from Tacky Wax and flux.

HOW TO MAKE A MOLD FOR \$2.00!

Ross Whipple (Finland) writes: "The high price of lamp molds has been a real put-off here, so recently, while visiting one of our flea markets with imagination in

high gear, I purchased a 20" copper dome for just 90¢ to use to make my own mold. First off, I bought 2 rolls of 3/4" masking tape. I tore off a whole bunch of short pieces - 1 or 1 1/2 inches long and set them aside. Then I started to cover the copper dome with longer pieces - with the sticky side up! I tacked these in place at the bottom and top of the dome with one of the short pieces -(sticky side down). I continued until the dome was covered with the sticky tape. Next, I covered the dome again with long pieces of tape, but this time the sticky side is placed down - no need now to apply short pieces of tape. After this was completed, I covered it one more time, so that the dome was covered with 3 layers of tape. I used a razor blade to cut a circle at the top (about 2" in diameter) and then cut around the bottom edge of the dome. I was able to lift off a very fine blank masking tape mold! I replaced it onto the dome, drew my design upon it, covered it with clear plastic tape and then proceeded to build my lamp! After completing the soldering on the outside, I lifted the whole thing off the dome, removed my pattern/mold from inside the lamp and did the inside soldering on my lamp. Anyone could do this with a lamp made out of anything. The variety of shapes and sizes you find at fleamarkets is endless and fun!"

SQUIRREL BAFFLE, BOAT BUOY & BATHROOM GLOBE

Walt Boepple: When I walked into a garden supply store, I noticed a squirrel baffle that, to me looked just like a clear plastic lamp mold! My mind thinks in "glass" so whenever I see something like that, I wonder if it could be done in "glass". I look at objects and wonder if they would be a good "mold" to use for a lamp.

Carol Conti did a lamp a few years ago and used a boat buoy as a mold. Joan Luckhurst used a white bathroom type globe for a lamp a few years ago , but reminded us: don't solder it all together on the mold, because it couldn't come off! There are no limitations as to what we can use for making our own molds.

MAKE A MOLD USING WOOD, STYROFOAM & FIBERGLASS

Joan Bengston: The way I make molds is a lot of work and takes tools that many of you probably don't have. The process isn't for the person looking for a quick and easy way, but just in case you're interested I'll share it. I start out with a drawing of half the profile of the desired shade (from the center to the outside edge) actual size. I transfer that to masonite or thin plywood and carefully cut it out with a band saw. Then I take a 4' x 8' sheet of 2" thick styrofoam insulation that I buy from the lumberyard supply. I cut circles bigger than I need for the shape of the mold and glue the layers together onto a plywood circle base. At this point it looks rather crude, five or six disks high. My husband puts it on the turning lathe that has been geared down to slow speed and turns it to the shape I want using the masonite template I have made. His lathe has a chuck on the outside end where he can shape large objects. Instead of regular lathe cutting tools he uses a planer that looks to me a lot like a kitchen food shredder/grater. It smooths that styrofoam down beautifully. Then I cover it with fiberglass cloth and put three coats of fiberglass resin on it. This gives me a nice hard surface to work on. I sand it smooth with a sanding block, dust it off well and spray paint it white. A hole the size of a threaded lamp rod is drilled through the center. (I need this for my shade positioner.) And there I have a blank mold any size, shape or

description I want. For this method you must use a special resin that will not melt the styrofoam, but be forewarned that it is very expensive. All fiberglass has an extremely powerful smell and is best used in a garage or outdoors. A catalog can be obtained from Wicks Aircraft Supply, 410 Pine Street, Highland, IL 62249-1243 Phone: 618 654-7447

PLATING (LAYERING) GLASS

Bonnie Eckert: I do a small amount of plating in almost every lamp. Sometimes there's a "clinker" piece that looked fine on the light table, but just didn't look right when I had it off the mold. Plating can do wonders! It takes some experimenting with different glass - sometimes just ice white makes a big difference. In the 28" Peony cone I just finished, I plated four of the centers - but that was planned. The centers are very large and seemed to demand extra treatment. I cut some Chicago Art Glass iridescent white mini-turtlebacks which made the centers really stand out. Then I plated on the inside with some Bullseye cranberry. That gave the centers depth and are really beautiful. Try it sometime when you just can't find the right color or effect. You'll be pleasantly surprised.

Ichiro Tashiro: When I plate, I cut two identical-sized pieces of glass with different color/texture. I foil each piece individually. Then, I take the pieces and tape them together with a much wider copper foil. *Make sure that the foil is tightly glued to the pieces properly.* (By taping the two pieces together, you do not have to worry about dirt getting in between the pieces.) Position this on the mold. Please note that this piece is higher (extruding) than the rest of the pieces because the thickness of the double piece is, well, double. While soldering, the important point is DO NOT SOLDER this double piece now. After the rest of the lamp is soldered, carefully remove it from the mold with the unsoldered double piece and push the piece in so that the outer surface becomes level with the rest of the lamp. Solder in place.

Lynne Salcetti: When I plate a piece, I foil each piece and tin the foil with a very thin layer of lead. Then, I lead the two pieces together around the outside with just enough solder to seal them together. After that, I place them on the mold and use the method that Ichiro uses. (Place them on the mold until everything else is soldered. Remove from the mold and solder the layered piece in place.) This works fine for me.

Marie Jo Murray: Glass pieces that are to be plated should only be tinned at the areas where the two will meet. After tinning, clean thoroughly and apply patina to both pieces. Use a small amount of flux to solder the pieces together after you've removed the patina from those areas with fine steel wool. Sometimes, as I am choosing glass for a lamp's background, I go wild! In one lamp, I layered five different types of glass - including stipple water glass, to achieve the illusion of a lake. I even layered the petals of flowers that are near the lake with a clear ripple. This additional layer of glass gave the illusion of water ripples reflecting off the flowers.

Chaz Smith: Use a piece of mylar to trace the leadline around the piece to be plated. The tracing should be made larger than the piece to be layered so that, after the glass is foiled and soldered in place, it will not cut out any light. Copy the tracing on to your plating glass and cut. Foil and tin the plating glass. Clean this

glass as well as the area to be plated. Hold the piece in place and tack solder without using flux. Solder all the way around, but leave a small opening at the bottom. By soldering all around the piece, no light will show through gaps. The small opening is important so that water can drain out after you've washed your lamp. When you're satisfied with the plating, apply patina.

MOSAIC WORK ON BASES

Paul Crist: Do your own mosaic work on the Dragonfly or Arrowroot Urn bases. You will save some money as well as getting the colors you want to blend with your lamp! Make a paper pattern of the background on the base and lay this over the sheet of glass you have chosen. Cut it as a large piece and then cut into at least a thousand rectangles! Glue them on the base in the order in which they were cut.

Hal Sandler: Not wanting to buy a commercially mass-produced mosaic base to hold my Cobweb/Apple Blossom shade, I designed and built my own mosaic for a less expensive base (Spelter 134) and used glass that was compatible with this shade. I also made my own mosaic for the 16" Dragonfly and applied it to Classic American Lighting's Dragonfly Urn. The making of a mosaic for a lamp base is a 6 step process.

Step 1. An existing pattern must be copied or designed to fill the area on the lamp base. In order to scale the design or pattern to fit the required area, architects linen is used to cover the area of the lamp base that will receive the glass tiles. An exact outline of the area to be covered is drawn on the linen after it dries and can then be transferred to paper or any other surface. This approach will work if there are panels (repeats) involved or a continuous design is used. If the surface is highly curved, darts must be used in the pattern or allowance and compensation accomplished during the final glass application process (see below). Step 2. Knowing the exact dimensions, a previous design can be transferred or scaled to fit or an original drawing executed. Once the area design is executed, colors must be chosen and glass selected. Several copies are made of this pattern - at least one of which is a mylar copy.

Step 3. Opaque mylar (identical to that used for Odyssey patterns) is used to cut templates and is affixed to the glass for subsequent cutting. (Making of a mask prior to glass selection is useful, but it must be realized that light will not shine through the glass and so the glass should be chosen for its opaque coloration when light is shining onto the surface rather than through it.) The pattern is cut to tight tolerance. After cutting the glass, the final assembly is accomplished on one of the pattern copies (paper) and evaluated as to its color highlights and pull-in effects from lying next to contrasting colors. The width of the seam between pieces is totally up to the discretion of the artist. Remember that these seams will be filled with grout at a later stage. Step 4. Horizontal cuts are made in each glass piece of the pattern. The first cut is arranged to be in the middle of the piece and located to run horizontal to the platform of the base by drawing a line through the piece on the pattern. The width of a given horizontal cut is maintained throughout and tested for adequate coverage on the pattern. I have had almost 100% success in making these straight horizontal cuts in the various pieces using a well lubricated glass cutter and running pliers. I do not

recommend breaking by hand or using 2 sets of pliers. Obviously, the best effects are obtained when all pieces are cut parallel. After some practice, these cuts can be done by hand and the widths marked on the glass with a sharpie. For larger pieces, a ruler serves best. The horizontal cuts are then laid on the original pattern; they do not have to have widths that fit end to end with adjacent pieces. There is no grinding of these pieces, or of subsequent vertical cuts. Vertical cuts are made with widths at your discretion. The vertical cuts are made to establish a brick laying pattern for the piece and the over-all pattern. Smaller cuts are used should the surface have significant curvature. Step 5. The pieces are affixed using E6000 industrial strength silastic glue, manufactured by Eclectic Products Inc, New Jersey City, NJ. Before starting, I lay down a straight horizontal line all the way around the lamp base using masking tape at the center horizontal line of the pattern. One then works upward and downward from this line in subsequently affixing pieces. A thin layer of the silastic is applied to each individual piece and worked by gluing the center tiles first and then moving toward the periphery for each specific horizontal row. Each piece is held in place by hand for approximately 30 seconds. Excess glue is avoided by using a cotton applicator (Q tip) so that none of the silastic comes up in the seams between pieces that later need to be grouted.(Should this occur, the excess can be removed with an Xacto knife, but this is messy and difficult after the glue has dried.) Some touch-up grinding may have to take place to get final pieces to exactly fit in relief crevices of the pattern on the base along the periphery. The base is placed in a horizontal position during application of tiles and from side-to-side as tiles are placed towards the periphery. The base is left in the horizontal position over night to minimize the effects of gravity. Step 6. After pieces have dried over night they can be grouted. Use non-sanded grout since the spaces between tiles are at a minimum. Tint the white grout after making a paste using water. (Various tints are available as small tubes of concentrated paint pigment at hardware stores.) For regular antique bronze patina, I use burnt umber tint. I use masking tape to cover the edge of the base and not allow grout to contact this area since the lime in the grout attacks and discolors the patina. I do final touch up with a tooth brush and steel wool and use shoe polish on the edges where the tiles meet the patinated surface.

MAKE YOUR OWN GLUE CHIP TO USE IN A LAMP

Joan Bengtson: Most chipping is done on window glass or thicker plate glass. The process may be done on whole pieces of glass without any resist or design work. Wonderful results can be achieved by chipping the flashed side of flashed antique glass. Materials needed: animal hide glue granules, cold water, sandblast resist, masking tape and silica gel (optional). •Clean glass well and apply sandblast resist, working out bubbles. •Transfer desired design onto the resist. •Cut along design lines with a sharp stencil knife. •Peel the resist off the areas to be chipped. •Sandblast thoroughly. •Carefully brush or vacuum away dust on the glass, but don't use any cleaner. •To conserve glue or to confine it to specific areas, make dams with 1/2" (or wider) masking tape. •Fold the tape lengthwise - off center and sticky sides together, leaving about 1/4" of adhesive exposed along one long edge for anchoring it to the resist. •Stick the exposed

adhesive to the resist at least 1/2" away from the etched area that you will be chipping - bending it so the doubled part stands up to hold the puddle of glue.

- Mix glue granules and cold water in a ratio of 1 part glue to 2 parts water by weight, not volume. (Use a kitchen scale.)
- Cover the container and let soak a few hours.
- Set the container in a little water in a covered pan - like a double boiler.
- Heat slowly and stir occasionally, being sure it doesn't boil or cook, until the glue is about as warm as the hand can stand (140-150 degrees F.)
- The glass should at least be at room temperature.
- Make sure the glass is level.
- Pour glue and spread very quickly. I use my hand to spread the glue to a reasonably even thickness of 1/16" - 1/8". Thin is better than too thick. Don't go back and touch up since the glue gels very quickly and you risk loosening the glue from the glass.
- Let dry at room temperature with gentle circulation until the glue is leathery but still soft enough to cut with your stencil knife.
- Cut through the glue along the design lines at the edges of the resist. This makes a nice clean sharp edge to the chipped design area.
- Continue to air dry until the glue gets transparent and you can see tension starting. Drying time is quite variable depending on temperature and humidity, but usually it takes 12-24 hours.
- Now, you want to force fast drying. What you choose to do depends on the size of the glass, the season of the year, etc. Use one or more of the following methods: set up fans, turn up the heat in the room, hang heat lamps above the glass or set glass in the sun. Small projects may be finished with silica gel.
- Cover the glass with a thin cloth.
- Sprinkle silica gel over the cloth. (This makes rescuing the silica gel for reuse easier so that it doesn't get mixed in with the glue chips.)
- Place this assembly in a plastic bag or cover it tightly with plastic. Soon, the glue will start to shrink and split. As it continues to shrink, it pulls the surface of the glass off in a fern-like pattern. You can hear it crackle. Some of the pieces pop and fly off the glass, but don't "help" it. Be patient and let it work.
- When it's done chipping, you have a lot of glue pieces with thin, sharp glass on one side to clean up. Brush it away carefully (but don't use your hand) and dispose of it.
- Tiny bits of glue that remain stuck on the glass can be removed by soaking with water.
- Now you can peel off the resist and polish up the finished glass with your favorite glass cleaner.

MAKE YOUR OWN FILIGREE

Ted Hasenstaub: My experience in making filigrees came out of necessity. It all started when I found a lamp in an auction catalog by Tiffany that I fell in love with. It was the Zodiac lamp. A 22" globe type lamp that had all the Zodiac signs arranged around the globe. I knew that I had to build this lamp. Thus, the filigree challenge.

I assumed (never assume) that this would be a fairly easy task. But soon found out that there was a little bit more to it. I started out talking to my local stained glass store. They told me you could use thin brass stock, .006" - .008" thick, and nitric acid to etch them. I investigated this nitric acid method and it didn't take long to decide that this was definitely the wrong way to go. Without extremely efficient venting, nitric acid fumes are lethal. Enough said. I had to find another way. I have done some electronic circuit design and have etched out my own copper coated circuit boards. I thought that this may be a way to do the filigrees. I

went to a hobby store and purchased a roll of thin sheet copper .004" thick (it was used for doll houses). I then went to Radio Shack and purchased a couple of bottles of Ferric Chloride, and an etch resistant pen. These are both used to etch copper circuit boards. I cut out a small piece of the copper and drew a small design on it with the etch resistant pen. I poured the Ferric Chloride into a plastic container and then dropped in the copper piece. I came back in about 15 or 20 minutes to remove the piece. THERE WAS NO PIECE LEFT! I thought at first that I left it in too long but after a few more pieces disappeared, it became obvious what the problem was. I never protected the backside of the copper. What a dumb mistake. The ferric chloride ate through both sides of the copper sheet. On the next piece I protected the back with a piece of clear contact paper. Its plastic base made it impervious to the acid. The next piece came out ok but a little thin, I left it in too long. I adjusted the time by trial and error and finally achieved a half way decent looking piece. The next step was drawing the Zodiac filigrees. I thought that I could draw them on a sheet of paper, lay them over a sheet of clear contact paper and use a razor knife to cut them out, then attach them to the copper sheets. After drawing about 40 stick looking figures I finally was able to get one that looked pretty good. I tried cutting it on to the contact paper but with no success. The paper always ripped and I couldn't get the detail that I wanted. I had to figure out another way. Looking through glass catalogs, I came across some Zodiac stencils used for etching glass. They were called rub n etch. I purchased 3 sets. These turned out to be the wrong size so I had to modify them. I steel woolled off the copper and then transferred the stencil onto the copper by rubbing it with a small stick. I then used the clear contact paper to block out large areas. To be able to get small detail I again went to Radio Shack and purchased some printed circuit board resist material. This contained little pieces of resist material that I transferred to the copper. I then used a very small Exacto knife to cut out the designs that I wanted. By trial and error I was able to get the filigrees that I wanted. I then proceeded to the ferric chloride solution. The first few came out fine, but then it kept taking longer to achieve to etching. After talking to the people at Radio Shack, they suggested heating to ferric chloride solution to about 85' f. I placed a floodlamp over the ferric chloride solution and warmed it up to about 80' f. This proved to be an important key. The filigrees came out much crisper than before in a shorter period of time. I ended up doing the previous filigrees over again. After I had all the filigrees done I used my soldering iron to coat both sides of the filigrees with a thin coat of solder because they were very thin at this point. I kept them in a ziplock bag until I used them to prevent oxidation.

note: read more about this lamp in "A Sampling of Designing Procedures".

Peter Grotepass: Making filigree is really not a secret. I put one of the original size on my photocopy machine, reduce it to 65%, and make some *high contrast* copies on paper. I cut out the prints and leave 2-3 mm (approx. 1/8 inch) of paper at the edges, then I put the patterns on a piece of black carbon. From this I make 3 copies on transparent ppc copyfilm. To get my "film" for exposing to the etching resist coated brass, I fix the three copies with adhesive spray exactly on top of each other. I expose the 0.2mm (under 1/8 inch) brass plate, coated with

positive etching resist (bought ready to use from an electronics store) to UV light for 10 min. I develop the brass plate in a 20° C (68oF) bath with chemicals, however *which* chemicals I really don't know. (I asked in the electronics store, but they didn't know either.) It is a white powder, and there is only "Entwickler " (developer) written on the package. When the pattern appears on the brass in the developer bath, I rinse clean with water. The etching process takes place in a 50°C (122 degree F) bath of Natriumperoxyd (300 grams in 1 Liter of water) for 10-12 minutes. That's all. The equipment costs, in total, about \$350.00 US; chemicals and materials are extra. The etching tank is made from clear glass, is very small and stands upright, like a little aquarium. An electronic thermostat is necessary and a thermometer; therefore the expense. It works well.

Chaz Smith: The basic principle is that filigree is a thin metal with holes in it. We could cut or punch these holes, but this would become rather tedious! An acid solution will dissolve copper (just like the patina, only much faster.) Since we don't want to dissolve the whole sheet of copper, but rather only those portions not required in the filigree we must find some way of preventing the acid from attacking this portion we want as the finished piece. We must protect the back of the copper so the acid doesn't eat away the whole sheet from the back. You can use contact paper, but any water/ acid resistant material will work. Now we must apply a suitable resist material to the front of the copper sheet, in the design of the desired filigree, which will prevent the acid from attacking this area. (This is the same principle used in acid etching glass.) I used the black "fine point" Sharpie markers exclusively when I made printed circuit boards- the ones that are in all electronic equipment.) These Sharpie markers have a pointed felt tip and leave a heavy black line. It is important that a new marker be used so that it draws a solid heavy trace, as an old one that is partially dried up will not provide a solid line. The filigree pattern could be drawn with the marker and etched in the acid. However this could get rather tedious and does not lend itself well to multiple copies. (In the early '90's I read an article in one of the electronics magazines about a film that could be used to transfer images to pc boards for etching. A friend and I tried using standard overhead transparency film and achieved satisfactory results. This was the film (clear plastic sheets) they used back in high school to project the image the teacher was writing up onto the screen. It is sold as office supply stores and comes in standard 8.5X11 sheets.) Instead of using Sharpie marker for the resist, photocopy "ink" will work as well. We must have a way of transferring a photocopied image to the copper to make the filigree. The toner or "ink" on a photocopy machine or laser printer is actually a very fine powder. It is made to stick to the paper with static electricity, then melted in place. Ever notice fresh copies are warm? What we want to do is to melt the image off the copy and onto the copper. We must remember, however, that the copy is flipped over to do this, so the image on the copy must be a mirror image of what we want the filigree to be so that when it is flipped over it is correct. The copy must be dark so that when it is melted onto the copper, a sufficient amount is there to block the acid. So make a dark image of your desired filigree and photocopy it onto a sheet of transparency film. This should be a solid copy. Flip this copy over so the image is on the bottom, and lie it on top of

the copper. Now use a standard iron to melt the toner from the transparency onto the copper. Be sure the iron is set low enough that the transparency film doesn't melt. Now you have an image on the front of the copper, and the back of the copper is protected. Its time to etch- let acid eat away all the unprotected copper that is not part of the filigree. Again Radio Shack sells the appropriate acid- ferric chloride. It appears as a dark brown liquid. Pour it into a suitable pan; I used a Pyrex dish about 1/2 to 1 inch deep. Submerge the copper sheet with the filigree pattern on it into the acid. Gently agitate the copper back and forth to wash away dissolved copper and keep fresh acid on the surface - a pair of plastic tongs is useful here. This agitation will speed the process and improve the quality of the etch. Don't be afraid to take the copper out to check on progress. By the time it is finished you will have the filigree stuck to the contact paper. This should take 5 to 15 minutes. Wash this off well when it is done to stop the action of the acid. Now use fine steel wool to clean the marker or toner off the copper. Any slight imperfections can be trimmed with an X-acto or filed when tinning. Some points to remember - always wear your safety glasses when playing with acid. Have a water supply available to wash any spills. I did this in the basement sink. Wear old clothes - acid can make holes. Oh yeah, and don't answer the phone or the acid will eat everything before you hang up! This is really a very simple process. I encourage you all to try it! Don't be scared by the acid - it's not that strong. Experiment with a Sharpie marker to see how the etching process works. Have fun watching the copper disappear!

PAINTING ON GLASS

SB Anthony asked about paints that can be fired in a regular oven. She's used vitreous paints in her little kiln, but found that the firing often changes the transparency and color of some glass.

Lorrie Gordon: Pebo makes two such paints that I've used on glass - Porcelaine and Vitraine. Porcelaine was originally developed for ceramics and is opaque on glass. Vitraine was developed for glass and remains more transparent. Both are applied and then "baked" at a low temperature in a regular oven. They stand up to the dishwasher test, the window cleaner test, and more importantly, the fingernail test! No one can say how long they will endure since these products only came out a few years ago. The oven temperature is so low that the glass doesn't heat up enough to impact color. I would suggest that you paint the pieces first and then solder them into your project. These paints can be purchased at craft stores and at some art supply stores.

INSERTING PANELS INTO BRASS FRAME

Dianne Lee: When inserting the glass panels into a brass frame, do you design to fit just inside the opening and solder around the inside of the opening, or do you cut and design the panels to fit inside the complete panel - fitting top to bottom and side to side on each of the four openings?"

Jenny Hanley-Palmer at Odyssey, and a member of ASGLA, instructs us to allow about 1/4" overlap to the edges of your pattern so that each side can be soldered to the inside of the frame. She also emphasized that we should "rough up" the brass before trying to solder the glass panels to it.

HANGING A SHADE UPSIDE DOWN

Joan Bengtson: When hanging a shade upside down, it is especially important to run several vertical support wires on the inside of the shade from the aperture to the rim. Hanging chains should be attached not at the rim but about one-third of the way in from the rim. This is aesthetically pleasing as well as structurally sound. If possible, plan ahead and create loops in three (or for whatever number of chains you use) evenly spaced support wires for attaching the chains. If it proves too challenging to get the location right, make the looped wires separately to attach later. Cut pieces of wire 2" - 3" long and wrap the center of the wire around a small pen or other round object that approximates the diameter you want the opening to be. Then solder these looped wires securely over the support wires. The long 'tails' on the loops will add strength. Depending upon the design of the solder lines, the 'tails' may have to be bent to conform to the shape of those lines before they are soldered in place.

PEBBLE-CLUSTER LAMP SHADES

Marcia Field: The thought of using pebbles in your lamp shades may never have occurred to you, but I have had such fun over the past several years preparing the pebbles, fashioning them into "clusters" and then designing and creating the lamp shades, that I thought I would share my technique with you. Nature has provided for us a bounty of materials for lampshade making in the form of beach worn pebbles. I don't know where Tiffany found his pebbles, but he produced a lamp in 1906, (page 96 in The Lamps of Tiffany Studios book) that is made up of the same little pebble cluster "flowers" that I have found so interesting. I include my technique here, in the hope that you too can enjoy this endeavor. I collected my pebbles on Sunset Beach in Cape May, N.J., a unique beach in that the currents tend to deposit beach worn pebbles in preference to just sand. They come in a variety of sizes from about a mm to an inch or two. The beauty of these pebbles is that most of them are made of quartz and are therefore either transparent (thus the name Cape May diamonds) or translucent, and they come in several colors, red or pink, yellow, beige, white, and gray. I choose shapes that tend to be flat and that are round or oval. Since the pebbles are already well tumbled from the surf I need only tumble them for two to four weeks in fine grit and then polishing compound to achieve a high gloss, glassy finish. Then I'm ready to create my clusters. Once tumbled, I divide the pebbles by color, size and shape and place them into plastic baggies for safe keeping. In order to create the clusters, I pour out the group I desire into a box and start selecting pebbles in sets of 5 or 6 that are near identical and place these into the separate divisions of a candy box. An egg carton would also work, or any container separated into little compartments. Once I have several clusters set aside, I can then start foiling. Depending upon the thickness of the stone, I cut copper foil (either 3/16 or 7/32 in width) in half lengthwise and wrap the edges of the stones as I go. I enjoy this wrapping activity because I need not be in my studio. Since I'm not cutting glass or soldering, I can sit in front of a TV or be with family in a much more casual environment. I make sure that to keep the pebbles of any set together, for once foiled they will ultimately be soldered into a cluster. When I started the soldering operation, I found it difficult to keep the roly-poly stones in a circle in order to solder them. I solved the problem by placing them onto the

sticky side of a piece of duct tape which was wrapped sticky side out around a small piece of plywood. Voila! The stones stay right where you want them, and after soldering can be easily pulled off the tape, and the tape used again and again. When finished, the little clusters will end up with a hole in the middle, of any size from about 1 to 3 mm. Into these centers I then place a piece of dalle de verre that I have cut to fit, and have wrapped with a strip of foil that may be even less wide than that used for the pebbles. Alternatively you could simply solder the hole closed or use a smaller pebble, but I like the sparkle of that little piece of glass in the center. Once you have created all the finished clusters that you need, you're all set to make your shade. If you wish to make a shade like Tiffany's, start at the bottom of the mold and work your way up using the largest clusters at the lower edge and fitting in the smaller ones as you go up. Where it is impossible to fit clusters together exactly, I use a single appropriately sized pebble to fill in the gap or perhaps a small piece of glass. Also, keep in mind that the visual effect seems more interesting if the colors are randomly arranged. If you employ the little clusters as apple or cherry blossoms as I did in the lamp that appeared in the 2004 calendar, you then simply fit them into your shade in place of the glass blossoms. There you have it, a fascinating shade to create. Although it may take a bit more time in the collecting and formation of the clusters, the end results are worth it. I have found that working with pebbles is so enjoyable that I have now created three pebble cluster shades (one includes geode slices) as well as the cherry blossom shade. I've also finished a shade that employs the pebbles in place of translucent gems – a take-off on the Empire Jewel found on page 70 of the Lamps of Tiffany and also seen in the collection of the New York Historical Society. Those at the Society have been wonderful in sharing details of the lamp incorrectly measured in the book! I hope you can all find a source of these "little gems" and will enjoy creating with them as I have.

THE RING LOTUS PATTERN

Since neither the magnificent base nor the pattern of the lamp design were available, we in the Association of Stained Glass Lamp Artists had to be content with dreams of how we would do this lamp if we were ever given the chance! We discovered that Source One Lamp Bases makes a smaller replica of this particular base. This lampbase includes the tulip lamps that fit inside the shade. At about the same time, we discovered that Paul Crist, the owner of Odyssey Lamp Systems had the patterns for both the 25" and the 28" Ring Lotus and, up until that point, only Paul Crist Studios had reproduced the Tiffany Ring Lotus. After hearing of our great desire to get the pattern, Paul decided to give the Association of Stained Glass Lamp Artists both of these designs. Thanks to the creativity and hard work of Jan Randa, we now have a working pattern copy and instructions for building a Lotus lamp that we can use with the Source One base.

INSTRUCTIONS ON HOW TO BUILD THE RING LOTUS

Jan Randa:

Following are some instructions on using the Source One Lotus base.

- The 28" Lotus pattern from Paul Crist is shrunk to 20". (Each of the four pattern repeats will cover the area around two of the eight stems of the base.)
- Two of Worden's 19 1/2" styrofoam sectional molds are glued together and

sanded down so that they fit under two stems of the lamp.

- Cover the combined mold with masking tape.
- Begin the first section by drawing an outline on the mold of two of the stems and then trace the lamp pattern around this outline.
- Cut and grind your glass pieces. Use a glass easel and light table to monitor your work.
- The form should be tightly wrapped with Saran-Wrap.
- Foil your glass pieces and use Tacky-wax to hold them in position on the Saran-wrapped mold.
- Tack solder this section and then remove it - along with the Saran Wrap - from the mold.
- Now remove the Saran Wrap from the back of the glass.
- This section is now tack soldered to the stems.
- Since *the stems are not uniform*, you must repeat all the steps for the other three section, starting with outlining the next stems and drawing the pattern around them.
- After all four sides are attached to their stems, carefully fit the sides together and complete soldering.

CASTING JEWELS

Jerre Davidson:

Three materials are needed for this method of casting jewels: a set of all the different sizes of jewels to cast from, a shallow box or plastic container to cast in, and hydroperm investment material. Hold the jewels in place in the base of the box with Polygrip. Mix the hydroperm - 2 parts powder to 1 part water by weight. To eliminate the possibility of bubbles appearing, it is important to sift the powder into the water and slowly stir it with a wooden dowel to avoid incorporating air. Wait for this to set up. Once it has set, remove the jewels and clean around the edges of the mold. Smooth around all the outside edges to reduce stress points in the mold that might cause cracking. Score a groove around the outside edge of the mold and use high temp wire to reinforce the mold. Before adding glass, prepare the mold by firing it up slowly to the casting temperature. Now, start adding and stacking frit, cullet or shaped pieces of glass into the jewel molds. (If you use frit, you will get more bubbles.) Take this to a full fuse and soak for about 20 minutes - making sure they anneal as they cool. The resulting jewels will have a milky glow when backlit, but not as shiny as those you purchase. You can improve the shine by either using Back Magic - a low temp fire polishing substance, or by using acrylic spray.

TOOLS, AIDS, ETC.

LABELING YOUR LAMPS

James Sadelfeld: To identify your work, you can buy identification brass “mini-plates” to solder to a lamp’s rim or seam from Brassplate Engraving Co., 1618 Central Ave. NE, Minneapolis MN 55413. Their new phone number is 612-378-4775

Brad Berglund: I buy brass engraved plates with a size of 3/16”x1 1/4”. On these I have engraved my last name and a number that coincides with my lamp’s order of completion - Berglund 004 or Berglund 005. With a drop of solder at each side of the engraved plate, I solder it to the inside edge of the lamp’s rim.

Deb Sossi: My husband suggested we get an etching tool to engrave my lamp to formally identify it. We bought a Dremel etching variable speed tool and engraved my name, the year the lamp was built and the name of the lamp onto the lamp’s ring.

Walt Boepple: I use a vibrating engraver (similar to those police departments loan out to mark your TV’s etc.) It has a switch that allows you to adjust the amount of vibration you need to do the engraving. I write “Boepple” on a piece of the glass that is near the bottom of each lamp that I complete.

Ichiro Tashiro: In the past, I tried to sign my signature with many types of devices, but I could not sign properly. Now, I sign my signature with an oil-based fine-point marker and trace over it with an electric engraver. If the base glass on which I’ve signed is light-colored or transparent, I go over it again with the marking pen and then wipe off the excess ink that is left from the marker on the engraving. If the base glass is dark, I leave the signature alone so that it remains white.

Larry Cartales: I use a Dremel and diamond ball to write and then go over the signature with a gold sharpie pen. After wiping off the excess, this method leaves a nice fine line.

Joni Tornwall: If you are interested in a fusing solution to signing, here’s my method: I use Hanovia Bright Gold and a Kemper pen that has a little pot on it. I use a paintbrush to put a few drops of the paint into the pot and then write my signature with the pen. The engraved piece is then fired and comes out with a very durable, fine, bright gold line. In transmitted light it looks like a shadow.

MORTON SYSTEM

Conrad Grobbelaar: The lamp that I am currently working on is predominately gridwork, so I decided to use my Morton cutting board to cut all these geometric pieces. First, I set it up to cut strips of glass and then I adjusted the cutting bar to the correct angle in order to cut the left and right sides. In just a few minutes I was able to start cutting and didn’t have to figure out the angles or match the pieces to the pattern again. The Morton System was indeed a time saver!

BRONZE WOOL

Mary Ritter: I bought a package of bronze wool and it turned out to be one of the best purchases I’ve made for my glass work. Because it is not oiled, I can use it for buffing and polishing without it imparting a coating of oil on the solder. Then, after it’s “uglied out” beyond its buffing usefulness, I pull shreds of it off and use it as filler for large gaps such as at the tips of dragonfly wings. Because it’s not

steel wool but bronze wool, the solder wicks into it beautifully.

DUCT TAPE BLOCKS RUNNING SOLDER BETWEEN PANELS

SB Anthony: In order to solder panel lamp seams together, I use duct tape to hold the panels in place. It works great and blocks solder run-through to outside seams.

FURNITURE STRIPPER

Steve Bowen: Whenever I need to remove lacquer from brass, I use methylene chloride (furniture stripper). I use the aerosol and spray it on, wait a minute or so and then wipe it off. Once the finish is removed, it's just raw brass, so you can patina it as you like. When you are ready to apply a finish again, you can use brass lacquer (aerosol). My latest trick for applying a finish to brass is to use wax (butchers wax). I heat the brass with a blow dryer and apply the wax with a cloth. When it's cool, I buff it and apply another coat of wax to the cool brass and then buff that off. I like this effect more than lacquer since it has a softer, warmer glow. The other advantage is that it doesn't yellow or break down like lacquer does.

ACTION TIN

A product that is used to tin brass, is a liquid lead and flux that is brushed on and then heated with a propane torch.

ALTERNATIVE TO SOY RELEASE

Joy Ammons: Since Soy Release is no longer available, my husband, Audie, discovered another product that does a good job of cleaning wax off shades. It is called **Citristrip** and is available at Wal-Mart in their paint department.

XTR-311

Jennifer Buckner: Instead of trying to remove a cracked piece of glass that's shown up in your lamp, clean the broken piece with rubbing alcohol and then use XTR-311. This glue is runny enough to "wick" into the crack and make it almost disappear. This optical epoxy adhesive can be purchased from His Glassworks, Inc., 91 Webb Cove Rd., Asheville, NC 28804. Phone 800-914-7463

BULBS & LIGHTING

Try replacing the regular bulbs you've used to light your lamp with **GE Reveal** bulbs. These new bulbs offer a full spectrum of light, so you may be surprised at the new beauty you'll see in your lamp!

Chaz Smith: If you need more bulbs in a lampbase, particularly for one holding a large shade, you can use a 'Y' adapter that allows you to put two bulbs into one socket. I've done this on older two-bulb floor bases so that I could run four bulbs and am quite pleased with the results. If a base has four sockets, you could put 'Y's in two opposing sockets and leave the other two unaltered in order to run six bulbs. Or you alter all four of the sockets and run eight lower wattage bulbs."

Bob Tesch: Excessive heat doesn't do most things much good - even a good roast dinner. The effect of four bulbs depends on the total wattage of the bulbs and the ventilation provided in the top of the shade. With four bulbs and adequate ventilation, you would be able to keep the wattage to a minimum. I believe that with four high wattage bulbs, it would be possible to damage the shade. Even if it didn't melt the solder, it would seriously shorten its life or stability.

Tina Kellogg: I *always* put a dimmer switch on every one of my Tiffany

reproductions. This adds a little “mood” light when you don’t want a bright reading light and the lower wattage allows the lamp to give off an entirely different effect. And, if it’s a different effect you’re looking for, try Edison Replica Filament Lamp Bulbs. (We saw these bulbs in the Tiffany lamps at the Morse Museum in Florida.) Although they’re expensive, these bulbs give a beautiful golden “sun” glow when lit. Wow! What a difference a bulb makes!”

Ichiro Tashiro: The worst feature of fluorescent lighting is the flickering - at 50Hz, 60Hz or whatever, depending on where you live. I am not defending the fluorescent light, but the new fluorescent lighting system doesn’t flicker at all, since they use an inverter now that eliminates flickering. And, today, fluorescent tubes and bulbs come with different color temperatures and colors. You can even buy one that duplicates the color of an incandescent bulb. I think it is worth a try since they generate far less heat than regular bulbs do and they last a lot longer.

“TOUCH” DIMMERS

Chaz Smith: Recently, I bought some neat touch switch dimmer combos at Target. They plug into the wall and then the lamp plugs into them - right at the wall. They have a thin wire with a circular brass finish touch disk. Each time you touch it, it changes to low, medium, high and off. I like these, since all the bulbs turn on at once without having to pull the individual chains and they have a dimmer function. I’ve tried installing touch switches inside some of my larger bases, but their operation can be somewhat questionable, perhaps due to being enclosed in so much metal. When they do work, you can just touch any lead line and the lamp will come on.

CORNINGWARE REPLACEMENT OF KILN SHELF

Dan Rose: To shorten firing time in your kiln, take out the shelf and replace it with a sheet of corningware. Another material to make a form for slumping is Algonate.

GOOD SCISSORS TO CUT PATTERNS

Mike Barnes: Recently, I bought a pair of Fiskars Softouch Scissors for around \$10 at Wal-Mart. They are about 5.5 inches long with sharp pointed tips and spring operated handles that are very manageable. These scissors are great for cutting out pattern pieces.

SCALPEL WORKS BETTER THAN X-ACTO BLADES

Joan Bengtson: I use a scalpel now, instead of an X-Acto knife to cut out patterns. Scalpels are carbon steel, sharper and last longer than the X-Acto blades. Hobby stores carry scalpels for model airplane hobbyists. Since the scalpel blades don’t quite fit the X-Acto handles, you should also buy the handle.

FABER CASTELL MARKERS

Shauna Palmer: Try using gold, white or black solvent based permanent paint markers to mark your glass (Faber Castell is a good one, you can remove the marks with acetone). The second best alternative method is china markers (you know those wax markers you peel down the side with a piece of string), they come in lots of colors. Paint markers are available at any art, craft or office supply outlet. China markers can be a little harder to find, but I have found them at major office supply outlets.

PENTEL MARKING PEN

Mary Ritter: It is difficult to draw a visible pattern line on dark-colored glass and there are unending frustrations when trying to use silver or gold paint pens. One day I picked up a gold-ink Pentel gel pen (Hybrid Gel Roller) and gave it a try. I got a smooth, thin, effortless line that I could follow for scoring.

MANAGING A FULL SHEET OF GLASS

Barb Grollo: When I buy a full sheet of glass, I usually have it cut in half, just to make it more manageable. If I'll use it for a background, I'll mark both sides, either right or left, or up and down, so I can match the sections when laying out the pattern pieces.

HEAT GUN

Don Conti: Since heat helps patina to take, a quick way to prepare a brass cap for patina is to use a heat gun (which can reach 1000 degrees F) instead of a torch to heat the cap. Use a cheap disposable brush to apply the patina. You can buy heat guns (used to remove paint) from hardware stores.

FIX HARDWARE IMPERFECTIONS

Larry Cartales: Recently I tried fitting a wheel to a base and found that the machined area on the bottom of the wheel and the machined area on the top of the lamp base did not fit smoothly - there were a few small burrs or imperfections in each casting. The tighter they were turned, the more noticeable it became that they were not level. After I touched them up with a fine file, they fit well together.

FAULTY TELESCOPIC MECHANISM

Kevin Hendon: The telescopic Library base is beautiful! There is a slight drawback, however, with the mechanics involved in raising the base to increase the height. The turn screw on mine seems almost ineffective because of the weight of the 22" Tulip shade. I really haven't figured out how to correct this so I just leave it lowered.

John Cannon: What if you figure out the added height you wanted to keep the shade at, removed the turn screw, and marked the telescoping tube of the base. Then drill a small hole in the tube to accept the end of the adjustment screw at that mark to hold the tube in place and keep it from slipping with the weight of the shade on it.

Chaz Smith: Perhaps, instead of drilling into the tube, put a dowel of the appropriate length inside the outer tube for the inner tube to rest on.

TWISTING SOCKET WIRES

Chaz Smith: When twisting wires to be screwed down in a socket, twist them counter-clockwise instead of clockwise. (They still go clockwise around the screw, though.) This way, when you tighten down the screw, the twist in the wire becomes tighter rather than unwinding.

DIFFUSER

Don Conti: I purchased a 16" disc-shaped glass diffuser from a hardware store to attach to the underside of a 26" lamp. Since this lamp hangs above a dining room table, the diffuser takes care of those inevitable "glaring light bulbs". It also seems to contain the light so the colors in the lamp show better.

MOBILE LAMP

Question by **Mary Ritter:** I'd like to know how I can make my new hanging

shade more mobile so I could take it on field trips before I install it permanently in the ceiling.

Answer by Ernie Downey: Most lamp part suppliers have a vase cap with a receptacle built in that you install in the ceiling. It uses a hook in the center to support a lamp. You place a plug on the end of the lampcord and weave it through the chain, hook the chain over the hook and plug the cord into the receptacle. When you want to move the shade, just unplug and unhook. This allows you to move it without unwiring.

“FIX” CHEAP BASES!

Don Conti: Any cheap base that you have to use, but don't like the look of can be “fixed”. Spray the base first with “anodized bronze” (this is the brown color that you see on some aluminum window frames). Then get a tube of apple green acrylic artist color and wipe it on the base - a little at a time, using a slightly damp rag to wipe off the excess. The idea is to get the green into the crevices but not on the raised surfaces of the base. Since this may look too monochromatic, you can use a little blue in the green or other shades of green in conjunction with the original coat. When you're satisfied, you can spray the base with a clear coat of flat, semi-gloss or gloss.

WORKING WITH MIRROR

Joan Bengston: I use Rust-oleum Bar-B-Que black paint, heat resistant to 1000 degree F. I spread the mirror pieces out on newspaper face down and spray a couple thin coats of paint. It's effective as long as the mirror is well cleaned of any oily residue before painting and the paint is hardened thoroughly before soldering.

PHYSICAL RESTRICTIONS OF A STUDENT

Marie Jo Murray asked the chat group for ideas about setting up a workplace for her student who is wheel-chair bound, but has a great attitude toward life.

Lorrie Gordon: If a student has a great attitude, then anything else is just problem solving! I've taught several people with physical restrictions, so I'd suggest a couple of things:

- putting the project board on a “lazy Susan” will make it easier for him to work on all sides of the project while sitting in his chair. I built something similar to this for soldering lamp projects by mounting a circle bearing (find it in a hardware store's cabinet department) to a smaller square of plywood.
- arrange the work station in a “U” shape and create “task stations” on the three sides of the “U” - set up all cutting tools and surface in one section to make a “cutting task area”, do the same with grinders and soldering stations. People in wheelchairs can usually spin left or right easier than trying to reach down long tables.
- make sure that he has a long heavy-duty apron to wear so that solder drips will hit the apron and not his legs.

He's lucky to have a teacher willing to share experience and you're lucky to have an enthusiastic student.

HEALTH & SAFETY CONCERNS

HEPA FILTER

Nancy Pimental: For the past 14 years, I've been running a fairly large hepa filter to take care of the concerns of lead poisoning. This filter changes the air in my studio every 5 minutes. My students and I use the fume trap right on our work as we solder and take care to wash our hands frequently. The amount of lead in my blood continues to be at an acceptable level, but just as a precaution, I continue to have this test done every two years.

FACE SHIELD

Mazhar Janjua: I've purchased different safety goggles to protect my eyes during glasswork, but end up not using them - for one reason or another and then have to visit the hospital to have glass splinters removed from my eye. Recently, I found a face shield at a hardware store that turned out to be perfect. It is light, does not fog up and is easy to put on. Manufactured by North Safety Products <northsafety.com>

KEROSENE IS FLAMMABLE!

Paul Crist: If you use kerosene to remove wax, remember that it should not be heated above 150 degrees F, since it is very flammable. It should be heated to the point when it is only warm to the touch.

VENTILATE YOUR WORKSPACE

Paula Putirskis: I'd like to share a reminder with you, in hopes you won't go through what I just experienced! For the past 2 months, I have been unable to work with glass - a painful punishment! Instead, I've seen countless doctors and have undergone a lot of medical testing. Why? Lead poisoning from inhaled fumes. My studio is vented, however, when it turned cold, I shut the vent off to keep the heat in my studio. About the same time, I shifted to crafting my "small gift items" for the holiday season. I was working 16 hour days - doing hours and hours of soldering. The result: high blood pressure, facial and hand numbness, loss of appetite (30 pounds worth!), severe head pain and insomnia. Currently, we are installing an air purification system. Don't be dumb like I was - VENTILATE!

Carol Conti: If you can't work outside, make sure your work area is well-ventilated while soldering. An exhaust fan which draws out the fumes is necessary. A filtration unit is a sensible fixture in any glass studio. Plastic gloves will help protect your hands; long pants and a loin cloth will keep solder from your legs and lap! Shoes are a must to wear. Take off your rings. Pregnant women should NEVER be exposed to lead or lead vapors.

Mary Koehl: Adding salt will accelerate the action of black patina, however "salting" an acid can produce chemical reactions that could be dangerous, so take care.

INSURE YOUR LAMPS

Mary Anne Delorenzo tells of a tragic fire that destroyed her glass shop: "The solder on all the lamps just melted away. The pieces of glass survived, but there was no way to find what belonged to what. Make sure that you all have your lamps insured or have enough coverage on your homeowner's policy. This money doesn't cover the cost of replacing the lamp, but at least it will help with

the cost of redoing it.”

WIRING YOUR STUDIO FOR SAFETY

Nancy Pimental: When designing or remodeling a glass studio, I would suggest wiring your outlets in with your light switches. This way, when you turn your studio lights off at the end of the day, you’ll know that all the outlets are off, too. No need to worry that a soldering iron was left plugged in.

HOW TO TAKE CARE OF FUMES

Dick Watson: To avoid breathing soldering fumes, here is a way to move the fumes away from your workspace.

- Lay an approximate 1” diameter plastic pipe along the top back edge of your workbench and run it to an outside door. (If the pipe is too long, try a sleeve in the center.)
- At the workbench end of the pipe, fit an elbow with a short extension length of pipe. •Cut the small end off a large funnel and fit, glue and tape it over the extension end of the pipe.
- Raise the funnel to suit your work area.
- At the door-end of the pipe, take a strong, but old vacuum cleaner and cut the accessory end off its hose and slide it over the pipe. Use an auto radiator clamp to hold it in place. When you are ready to solder, start up your vacuum cleaner to draw the fumes out of the door. You can pack away the cleaner when it’s not in use.

DESIGNING

OBSERVE NATURE

Jon Ostrove: Look at nature with an eye for the intricacies of its lines to see if those lines could possibly be used as a design in glass.

Carol Conti: When you start experimenting with designs for an original lamp, use your garden flowers, photographs of flowers, greeting cards, pictures in magazines, books or seed catalogs for inspiration while you are sketching.

Nikki O'Neill: My approach to designing would be to simulate a scene in nature as closely as possible, making liberal use of photographs, and mentally take the leaps necessary to use a full range of color. The use of color and light and shadow seem to be a Tiffany hallmark. His lamps have odd colors in them - like blue streaks in poppy flowers that, in reality, have no blue in them, but somehow the Tiffany color palette works.

PATTERN (ARCHITECTS) LINEN

Pattern linen is old drawing material originally used by the architectural drafting industry to make finished renderings. It was manufactured from finely woven Irish linen that is sized with starch to give it body and provide a smooth drawing surface. Use pattern linen to draw your own designs on molds. When wet, it becomes pliable enough to conform easily to the curve of the mold. When dry, it is a skin-tight drawing surface that is durable enough to withstand repeated erasures without fraying or disintegrating. After your drawing is finished, it can be peeled easily from the mold in one piece. Unfortunately, architectural linen is no longer manufactured in a form we can use. (It was replaced in the '60's by modern plastic sheets like Mylar. Odyssey has been able to ferret out old stocks of starched linen that we can buy from them. We may also be able to find this linen at old architectural firms in our own vicinity.

Procedure for working with linen by Odyssey Lamp Systems:

- Pattern linen can be used on any smooth, non-porous surface. Absorptive surfaces, such as raw wood or plaster, should be coated with a water-resistant layer of wax or shellac to prevent excessive sticking of the linen to the mold. On the other hand, smooth, 'glassy' surfaces may cause the linen to release from the mold surface before it has a chance to dry. In these cases, the surface should be 'roughed up' with very fine sandpaper to provide some tooth for the linen to adhere to.
- It is important to establish an accurate geometric grid on the mold before you apply the linen. *Designers all too often cannot resist the lure of a blank drawing surface, and opt to put off the boring work of geometry until sometime later. This procrastination inevitably leads to it being done hastily at the end, and ultimately results in fitting problems down the road. Get it over with at the beginning and double-check it for accuracy!*
- If your design is to be repeated around the mold, it is not necessary to apply linen to the whole mold's surface. With a dark felt marker, draw straight radial lines on the mold to approximate one repeat of the pattern. These lines will show through the line, giving you a guide to what part of the surface you need to cover. To accommodate the irregular edges of the actual pattern design, the material should extend beyond the radial lines on both sides - at least one inch each way

for small piece patterns and two inches for larger piece patterns.

- The flexibility of wet linen allows it to conform to a spherical surface (i.e., curving in both directions) through about 15 degrees of curvature in both directions.

Since virtually all patterns on spherical surfaces span more than 15 degrees, the linen must be divided up into a number of segments to span the whole pattern surface. If the surface, or part of the surface, is curved in only one direction, such as a cone or cylinder, it does not have to be divided up and the linen segments can be as large as your material allows. There are no set guidelines as to the size and shape of linen segments, since these parameters are affected largely by the particular nature of the surface, as well as the size and shape of the linen. After all, when the linen is dry you won't even notice how many segments it's composed of; it only affects how much work it took you to get there!

- All linen segments should overlap each other about 1/4" on the mold to insure that they stick together securely. The linen is cut apart with scissors and this can only be accomplished while it is still dry. Don't even think about trying to cut wet linen because, even with a very sharp pair of scissors, it leaves an unacceptably ragged edge that just doesn't work. For this reason, the segments must be cut first, then wet and placed on the mold one at a time. This is reasonable, because you never know how a segment might distort when it is stretched out flat on the mold. Only after the first segment is in place can you accurately determine how to shape the adjoining edge of the next segment. Thus, they are done one at a time until the whole surface is covered.

- Try to keep the segments as large as possible. To stretch their range, slit the edges (about 1" into the segment, perpendicular to the edge) so that the two flaps created by the slit overlap each other when the linen is flattened out on the mold. Stretching often results in a gap in the crotch of the slit. This gap should be covered over with a separate linen strip about 1/2" wide. Such "darting" is useful around sharper curves.

- The linen is applied to the mold wet. For wetting the linen, use a shallow bowl with a flat bottom, at least 10" in diameter, filled to a depth of about 1" with warm tap water. It is also recommended that you add about one teaspoon of white glue (such as Elmer's) per pint of water to aid in surface durability and adhesion. The linen segments are immersed in the water/glue for as long as it takes them to become pliable (20-30 sec.) and then immediately transferred to the mold sopping wet. (If you leave them in the water too long, they become fully limp and are difficult to handle and position correctly on the mold.) As the pliable segments are being laid out, the excess wetness will continue to soften them as you spread them out smoothly over the surface. As the linen is being laid out, bubbles inevitably form under its surface and these should be "squeegeed" out to the edge with your fingers as you go along. While working on the surface, keep the linen quite wet, as this will make the smoothing and minor adjustments easier to do.

- After all of the segments are in place and the surface completely covered, pat up all of the excess water with a damp sponge or paper towel. Don't rub it, just pat. At this point, the mold is left to dry in a warm place, which usually takes from two to four hours. The last areas to dry will be the overlaps and these should be

completely white before you start drawing. At this point, trim off the excess linen at both the ring and rim ledges with a single-edge razor blade.

•For drawing on the linen, use a soft pencil and an ordinary Pink Pearl eraser. The linen surface can be penciled on and erased as many times as the creative mind changes itself. When erasing lines drawn on top of an overlapped seam, try to erase in the direction of the seam. After the design is finalized, it is a good idea to go over the lines with a dark ink pen to make them permanent.

TRANSFERRING A LINEN PATTERN & PREPARING THE PATTERN

Carol Conti: *You can either draw your design on the linen (and trace it through to the mold) or draw your design on the mold (and trace to linen)*

Drawing the design on the linen

1. With your prepared linen on the mold, use a pencil (and plenty of erasers!) to draw your design on the linen.
2. When you are satisfied with your design, lift the linen off the mold. (You might have to use scissors to cut through the linen at one side to make it easier to remove. When the linen is replaced on the mold, this cutline can be held together with transparent tape. Since linen is durable, don't be too concerned about tearing it.)
3. Lay carbon paper over the mold.
4. Replace the linen over the carbon paper and mold.
5. Transfer your design to the mold by tracing over the drawing you have done on the linen. (If you use a colored pencil, it will be easier to see what you have already traced.)

Drawing the design on the mold

1. Lift the prepared linen off the blank mold and set aside.
2. Use a pencil (with erasers at hand!) to draw directly on the mold.
3. When you are satisfied with your design, use a black Sharpie marker to draw over all your design lines on the mold. (This helps you see your lines through the linen.)
4. Place your prepared linen on the mold.
5. Transfer the design drawn on the mold to the linen with pencil. (Use a light fixture to light up the inside of the mold so your design lines show better.)

Preparing your pattern

1. Remove the linen from the mold.
2. Following some lines of your design, use scissors to cut enough "darts" to allow the linen to lay flat. Tape the linen down to your work area.
3. Tape down a sheet of clear mylar over the flattened linen.
4. Trace your design onto the mylar with a fine Sharpie pen. Add numbers. This mylar is your master copy from which you make photo-copies of (1) paper for reference, and (2) another mylar copy that you will cut apart to use as your pattern pieces.

Nikki O'Neill: Before I use the linen, I draw a symmetrical grid and repeat sections directly onto the blank mold. Then the linen is applied to the mold. After it has dried, I draw the design directly onto the linen. When the drawing of the design is completed, I remove the pattern linen from the mold and cut it into repeats. The repeats are taped, one at a time, over the mold sections and the

design traced through to the mold using fine carbon paper. A few pieces of tape keeps the linen stretched exactly to the reference lines on the mold. After this tracing is completed, remove the linen and cut to lay flat. The flattened linen is then used to make mylar or acetate copies for the pattern pieces.

Twyla Morgan: In order not to rush the drying process after I applied the linen to my mold, I placed it in the refrigerator so that it would dry slowly. While the linen dried,

I used a 1" wallpaper roller and went back now and then to smooth down the seams. The result was very few bubbles. The "fridge" method works in hot California weather!

DRAWING REPEATS ON A MOLD

Joan Bengtson: Here are the steps to follow in order to make repeats of your design come out correctly:

- Mark section lines on the mold.
- On your drawing paper, make a vertical line through the center of the paper. The design will have to be complete from top to bottom, but not side to side.
- Cut the design apart at the line, but cut on the lines of the design instead, going back and forth across the vertical.
- Take the right half of the partitioned pattern material and place the line that runs through it directly on top of the left section line on the mold.
- Do the opposite by taking the left half of the pattern material and placing the line that runs through it directly on top of the right section lines of the design, with jagged edge, correctly placed on the mold.
- Connect and fill in the middle portion of the design on the pattern material.
- Trace it lightly onto the mold and make adjustments, if necessary.
- When you like what you see, darken the design lines with a permanent marker.

Twyla Morgan: Since my design is based on 3-repeats, I was concerned about the left and right sides lining up. My solution: after dividing the mold into thirds, I continued the drawing of a flower over the division line on the mold. I cut a small strip and linen and traced the flower onto it. I moved the strip to the next division and lined it up. With carbor paper that I bought at a fabric store, I traced the flower onto that line. After completing the drawing on all three divisions, I filled in the rest of my design. I cut my linen down through the lead lines to flatten it so that a mylar pattern could be made.

This Poppy Garden lamp by Twyla appears in our 2004 calendar

FROM ARCHITECTS LINEN TO VELLUM & MYLAR

Brian Hitchcock: When I was going to college, I worked a summer job at an engineering firm. One of my jobs was drafting and making copies of the architectural drawings. I vividly recall making those copies. I had to take the original drawings that were made on vellum (high quality parchment) and run them through the machine that used UV light and ammonia to make the copies. There was no ventilation, so I would go home coughing and crying. There were no regulations about such things in those days. I completely understand why no one is using the ammonia process anymore. Mylar is used because it is dimensionally stable. If the overall drawing of a building expands by even a small amount, it may represent a great deal of concrete later on. Mylar is better for long

term stability of the original drawing, but it is harder to make the drawing...you can't just draw on mylar with pencil the way you could on vellum. I understand that large drawings are now printed on a printer or plotter directly from the computer system where the drawings were made. The days of keeping the physical drawings are fading.

MAKE YOUR OWN LINEN

Rene Trepanier: Instead of buying architects linen, I decided to try to make my own. I cut a brown paper shopping bag into strips and soaked the strips in water. As I laid them up on the form, I overlapped each of them by about 1/2". Then I brushed on a mixture of 50% Weldbound glue and 50% water. Since the paper is wet, you can stretch it to remove all the wrinkles by smoothing them out with your hands. After I was satisfied, I once again brushed the prepared strips on the mold with the glue/water mixture until it was thoroughly soaked. I let it dry and then I lightly sanded it to smooth it out.....Voila!

DESIGNING WITHOUT USING ARCHITECT'S LINEN

Joni Tornwall: To re-use an incised mold for my own design, I use plain beige masking tape to cover the mold. I start at the top edge where the ring goes and put a strip going down to the bottom where the rim goes. I move over and put another strip next to that. I keep doing that until I've gone all the way around the top of the lamp. Of course, there are big white pie-shaped areas left toward the bottom, so I cover them with tape. After the mold is covered, I draw on the design. If it's a repeating design, I use a compass to divide up the mold and then transfer my design from my flat paper to the actual mold. I do this in pencil first and then, when I'm happy, I trace over the lines with a marker. A pencil marks and erases nicely on masking tape. Finally, I trace out the design (using tracing paper) and then make mylar templates to use to cut the glass.

Pierre Leblond: Here the steps I follow to design a lamp:

- decide if the design will be with or without repeats. (It is more complicated with repeats.)
- outline a space on paper that follows the contour of the original pattern – repeated if needed.
- draw a first sketch within this space.
- cover the mold with masking tape.
- transfer the sketch onto the mold, adjusting the background so all fits well, and then redraw the lines with a marking pen.
- copy the individual templates from the mold onto tracing paper or mylar.

Mike Barnes "I draw my design on paper for each sector. I then place carbon paper on the mold and transfer the 2 drawing to the mold. Another way is to draw your design on the mold, trace to paper and then use carbon paper to trace the other repeats onto the mold.

Brian O'Donovan: Here is a possible alternative to masking tape. I cover the mould with cling film – like Saran wrap, and then glue strips of paper to the cling film using a glue stick. When the design is completed, I cover the design with sellotape and peel it off the mould. (Take care not to stretch this tape.) It can be used in the same way as architect's linen is used. I cut the cling film roll into three sections...this makes covering the mould easier.

Elie Nasser: Use an actual pattern as reference for the outer edge and then draw your own design on paper using just the free surface for the main subject. Have this copied 1:1 and simply paste it to the mold. Once it's on the mold, you can easily fill the gaps on one division and apply the same pattern of this detail to the other repeats.

A SAMPLING OF DESIGNING PROCEDURES

Annette Tamm: After I purchased Handley's Cat base, a Halloween design for its shade immediately came to mind. I started searching my collection of pictures and catalog files for ideas for designing. And, because of its unusual shape, a piece of my Mexican pottery became the mold on which to build this shade. After covering the pot with masking tape, I started drawing (and erasing!) my design onto the wrapped "mold". After I was satisfied with the design, I followed up using architects linen in order to produce the pattern for the lamp. *Surprise lamp is featured in our 1997 calendar.*

- I decided that designing something based on the four seasons might be unusual and, at the same time, might give me a chance to play with my newly-acquired slumping skills - specifically, trying my hand at faces. When I chanced to see a garden sculpture of four faces depicting north, south, east and west, it struck me that this was how I could combine the two ideas that I wanted to play with. Choosing foliage appropriate to each season was fun: dogwood - with lots of pink and light green seemed to fit spring; laburnum - with its yellows and slightly deeper green seemed more summery; autumn leaves have their own characteristic panoply of colors, and holly - with its attendant red berries, fit the winter theme. This was my process: first, I made a face of clay that hardened well enough in water so that I could pour mold material over it. However, almost without exception, every time I slumped a face, the mold broke. Although the result wasn't too useful to get a full face, I could often use the broken parts for the outer sections. At first my concept was to have the four faces made of suitable colored glass for each season. I found that glass of just one color generally stayed in one piece during slumping, while the more "foliage-looking glass (confetti, fractures and streamers) generally broke into two or more pieces. Also, the one piece, one color glass didn't slump nearly as well as the multi-colored glass - meaning that the nose and lips weren't well defined. But, if I combined both the one-color glass underneath and the multi-colored fragments on top, I found that I had the effect of a face seeming to emerge from its seasonal flora. I had a wonderful time slumping leaves that surround each face. No particular design governed their production...I simply made leaves curving in various directions and tried placing them in different positions until things looked like they flowed well. *Annette's Faces of the Seasons lamp is featured in our 2001 calendar*

Hans-Willi Franken: It has always been a challenge for me to create 3-dimensional lamps. In my own small studio, I create very unique lamps using my own technique to build these objects in the Tiffany style. The 3-dimensional Parrot rests on a tree. The tree is made of copper + lead and the whole parrot is made of Oceana glass. Starting with a styrofoam block, the parrot is cut in 1:1 natural scale. The glass was put together one to one piece (that means cutting one piece of glass, working on it till it fits, grinding, copper foil, soldering and then working on the next piece of glass! After so many problems, it took some hundreds of hours to finish it - at least one year of work. The height is 16.5 inches. The Kingfisher sitting on a tree is completely made of copper and lead, worked out of the material by carving the lead with a small drill. The wings and

the tail feathers are made of Oceana glass. The whole sculpture is in 1:1 natural scale and is nearly 12" high. The Kingfisher is illuminated by a special halogen bulb - without UV, because it gives the same light as a normal halogen bulb but not the same heat! *These lamps by Hans-Willi are featured in our 2000 calendar.*

Marcia Field: Over the years, I have come to use smaller and smaller pieces of glass in order to achieve realism and excitement in my creations. Fascinated with the sparkle of dall de verre chips combined with antique glass, my first experiments with lamps were with clear glass. The glare of the light bulb soon alerted me to the fact that I needed glass that was more opaque, so I turned to the opalescent glasses. I continued to design my own lamps and often built my own molds out of materials such as paper mache. Even today, I continue to design lamps free hand onto the form and then solder the shade as I build it. Enthralled with the use of small pieces of glass, I discovered that opalescent glass, cut in 1/8th inch pieces and turned on edge, created vibrant and interest patterns that resembled the variations in a butterfly wing, or were appealing when used as border designs. A recent shade was made by creating flowers individually on the table top and then fitting them onto the mold wherever they looked best according to shape, color and their appearance in nature. There are 14 species in my flower garden shade - plus a Monarch butterfly and a ladybug, with the background composed of greenery appropriate for each blossom. I prefer to have the flowers as varied as possible, so no two blossoms are absolutely alike. (*see our 2003 calendar*) I strive to have my biological representations as accurate as possible and also enjoy incorporating natural materials such as shells and stones into my designs. *Marcia's lamps have been featured in many of our calendars*

Ken Briggs: I enjoy the challenge of drawing geometric designs; it seems that every second shade that I do has some geometry to it! The Rose/Butterfly was particularly tough to figure out since all I had to work from was a small (2") picture from a Tiffany Exhibition flyer. Here is my explanation of how I drew and developed this pattern.

First, I always draw my designs directly onto (Odyssey) blank molds with pencil. I feel this is by far the most accurate way to work, especially for geometric designs. For geometric work, I use compasses and work from a small hole placed dead center at the top of the mold. This hole should only be large enough to accomodate the compass. (I take my time finding dead center since all the work that follows would be off if this placement is not accurate.) Then I grid off the whole form horizontally. This measuring is done with a flexible seamstress-type tape to get the proper decrease in height for the rows as they move up the lamp. Then I use a compass to draw in the lines. (If you don't have a large compass at hand, use a nail/string/pencil "rig".) Once that is done, I tackle the vertical lines. Again, I use the flexible tape to measure the circumference at the rim line and divide it into equal segments. The segments should be roughly proportionate to the horizontals. This takes some trial and error (lots, actually!) until the proportions look right. I use the flexible tape as a ruler for drawing in the verticals, too. I line it up with my pencil marks and put the mold on it to hold one end in place, then stretch it tight with one hand and draw the line with the other

hand. (This is how I work on basic (rectangle) grids. The hexagons in the Rose/Butterfly were at another level, as in LOTS more trial and error. The process just involves plotting vertical lines for the “tips”. I did just two vertical columns until they looked right and then duplicated them around the mold. I was patient...for every pencil I use, it seems I use ten erasers! After the hexagons were drawn in, I free-handed the Roses and Butterflies in a pattern similar to Tiffany’s. This design is repeated three times. After the drawing was completed, I used a marking pen to enhance the pencil lines and then laid up the architect’s linen. After attaching the linen and letting it dry, I made sure that the linen was securely taped down to the mold before I started tracing the pattern onto it. If the linen had shifted while I was tracing, I was doomed to begin again. Unlike flowers and such, there can be absolutely NO slack in this one!

Ken’s lamps have been featured in many of our calendars.

Dan Pilon: I based my interpretation of Tiffany’s Grape Trellis on a photo in the Neustadt book. Tiffany’s Trellis is a 12-sided lamp, but I separated each trellis and created 24 sides - making my interpretation 30” in diameter. To keep the sides “true” during construction, I taped the panels together and then taped their bottom edges to a 40”x32” plywood base with a 2-foot diameter hole in the center. After soldering the outside, I turned it over and soldered the underside through the large hole in the wood without having to untape the lamp from the wood. I rotated them together to get each edge horizontal. Next, I soldered in the pieces that straddle the trellis uprights and soldered a copper wire around the top edge. By then, I had confidence that the lamp was sturdy enough, so I untaped it from the wood, soldered a copper wire along the bottom edge and then did the final soldering of the entire lamp. To complete the lamp, I soldered a ballchain strand to the bottom edge. *This lamp is in our 2001 calendar.*

Joan Luckhurst: To design my Hibiscus, I took photos and collected pictures of many varieties of this flower, sketched different angles of flowers and leaves and then had several copies made of these sketches. On a blank 20” mold that I got from Odyssey, I arranged the sketches to my satisfaction and then traced them onto the mold. The pattern was prepared using the pattern linen method. After cutting and laying the lamp up on the mold, I discovered that the glass pieces in the upper and lower background - as well as those in the border, needed to be slumped to insure a proper fit. It turned out that the slumping added a nice feature to the lamp!

This lamp is in our 2001 calendar.

Jon Ostrove: The design of my Salmon lamp (*1993 calendar*) began with a collection of drawings I made from photos and moved on to considering how the fish could be represented in glass. I followed my initial concept with a watercolor drawing. The next step was to decide where to place the cut lines that were needed on the fish bodies. I determined that this could be accomplished by continuing the lines - that were drawn for the water pieces, over onto the bodies of the fish. I used the linen method to prepare my pattern.

• An Azalea’s branchwork and the organic consideration of how flowers grow out of these branches were my main concern when I designed the Azalea (*1995 calendar*).

I was able to achieve that third dimensional look in this design by forcing branches and flowers forward on the lamp.

- For the *Camelia (1997 calendar)*, I found I only needed to draw a conceptual sketch of the lamp rather than having to draw out the full-blown design. The flowers that I sketched were found in my neighbors' gardens. After studying the structure of this shrub and what the flowers should look like, I drew out flowers, made copies of them, cut them out and then arranged them on the mold.

- The gnarled branches of a dogwood tree inspired me to use these branches in my design of the *Dogwood (1999 calendar)*. I was able to extend the branches as cut lines. To get the flowers to look "alive", I searched out variations in the glass and found the light and shadows that were necessary for the contrast I wanted.

Ted Hasenstaub: For my interpretation of Tiffany's 22" Zodiac lamp, I used a 20" Whitmore Durgan mold, re-scaled the dimensions to fit this mold and then divided the lamp into 6 sections. I covered 1/6th of the mold with masking tape and drew out one section on this taped area. I numbered the pieces on my mold according to my color scheme and covered the drawing with clear contact paper. (There is a total of 1,002 glass pieces, 42 filigree pieces and 6 large jewels in the shade.) I ordered the large jewels from Whitmore Durgan - they are rock chip finished, with sharp faceted faces that turned out to be too large for my interpretation. After cutting them to the approximate size I needed, I set the jewels in my kiln and raised the temperature to about 1200 degrees F to soften the glass. I left the jewels in about 15 minutes so that the sharp edges melted down to a smoother look. After removing them and grinding them to the exact size I needed, I found that I had to plate these light yellow green jewels with a blue pebble glass in order to get the darker green color and texture I wanted. The zodiac filigrees took the longest time to make. After discarding the potentially hazardous idea of etching them through brass sheeting with nitric acid, I decided to use 36-gauge copper sheeting. I reworked some zodiac stencils and purchased resist material and ferric chloride solution from Radio Shack (material used for making and etching copper printed circuit boards). I rubbed the stencils and resist material directly onto the copper sheets - adding a few stars and moons. I cut the copper sheeting into circles that were larger than needed and applied clear contact paper to the reverse side of each filigree so that the ferric chloride wouldn't eat through both sides at the same time. After experimenting for a few months, I produced my first usable filigree. The others soon followed. I coated both sides of the filigree with a thin coat of solder to add some stability. After building the 6 identical sections, I soldered them together and then soldered in a 5" ring and 20" rim. Finally, I reworked a generic vase cap by adding a finial from a 1930's lamp. *This lamp is in our 2000 calendar*

Ken Briggs: Flower catalog photos inspired me to design my Lily lamp. I chose my favorites from dozens of pictures of this wonderful flower that Lori and I had pasted up in the studio. Copies and cutouts of the lilies were made and then I experimented

with their placement on the mold. When I was finally satisfied with this step of the process, I traced around the cutouts. After using up one pencil and ten erasers, I

completed my drawing of the design on the mold and made the pattern. (I use the linen method for pattern preparation.) I made an extra linen on which I experimented with a variety of colors and intensities, rejecting the look of a lamp covered with “color’coordinated” lilies and decided on a multitude of colors found in some “special” scrap glass that I’d been saving. *This lamp is in our 2002 calendar*

RE-DESIGNING

Alex Glassman: To re-design a Tiffany floral pattern, I put the old Odyssey pattern on my light table and lay new paper over it. On this paper, I trace the outline of the outside edges of the original pattern - including the blank areas (crevices) that extend into the pattern. (This allows room for the new design to fit onto both the top and bottom of the spherical surface of the mold.) Then I remove the Odyssey pattern and begin to design my own onto the new paper.

Remember that the size of the pieces you are designing are not too big or too long for the mold. To make sure, compare them with pieces on the original pattern. Now, concerning those blank areas (crevices), you’ll have to use them creatively so they will close up on the mold. Look at the old pattern for ideas to use the crevices...maybe a branch, stem or leaf will fit.

DRAWING GEOMETRIC DESIGNS ON A MOLD

Walt Makos: One way to draw grid lines on a mold is to use a marking instrument - a base that has a pole sticking in it. From the pole, you attach a pencil (or holder with a pencil) that slides up and down the pole. By sliding the pencil up and down on the pole and moving the marking instrument around the mold, you can mark off parallel lines on the mold. (Be sure to set the lamp mold and marking instrument on a flat surface.) To speed up the process, set the mold on a lazy susan and spin it while using the marking instrument.

Chaz Smith: A great new tool, the “Lazerpro Picture Perfect”, projects a laser line -about the width of a sharpie marker line. If you aim it at a mold from the side, it draws a straight line up around the contour of the mold. To section up a geometric mold, all you need to do is first mark around the bottom where you want the lines, then project a line with this tool from your mark up to the center of the top of the mold. Now trace the line onto the mold. The tool is available in the lighting/tools section of Wal Mart for \$9.95.

TIERMAKER DESIGNER

A great stained glass program that answers questions about angles, heights and diameters for panel lamp designing. Russ Heeschen is the designer and programmer of this new and very useful tool. For those of you who would like to contact Russ, his email is russhesch@attbi.com

SHRINKING A PATTERN

Merle Jones: To shrink Tiffany’s 18” Trumpet Vine pattern down to 10”, I started by ordering a blank 10” mold (T349 from Odyssey that has the same shape as the large Trumpet Vine). Since this pattern has four repeats, I divided the small mold into fourths. I used a Zerox machine and dropped the original 18” pattern down to 50%. By calculating and adjusting, I continued shrinking the pattern until I reached the desired size. Then I traced the adjusted pattern onto the blank mold using carbon paper and then retraced the lines with a Sharpie marking pen.

Since the original Trumpet Vine uses a crown, I redesigned the top portion of the smaller lamp by extending the branches and slumping the upper glass pieces in my kiln.

DESIGNING WITH PHOTOSHOP

Sonali Shankar: Ever since I became a member of ASGLA, I am encouraged to keep thinking of new designs for lamps. In fact I just finished work on a new three panel design of tulips that will be installed in a wooden frame. I use Adobe Photoshop 7 to design all my lamps. First of all, I draw the designs and colour code them. Then I use filters in the program like “render” to “throw” light on the drawings to see how they might actually look when lit from inside. It’s great fun!

GLASS EYE 2000 SOFTWARE

Jill Ballam: I’ve been using the Glass Eye software for years and I absolutely love it! Although I use it mainly to design windows, I’m using it more and more for designing lamps. You can make a picture by taking a photo off the internet, use one from your digital camera, or scan in an image. Once you have that image, you trace over it with the drawing tools in Glass Eye and fill in your image with glass of your choice. The program includes glass from Youghioghney, Uroboros, Kokomo, Wissmach, Spectrum, Armstrong and Bullseye. You can re-size your design to any dimension that you like and choose any size width for the lead line. It took quite awhile to learn all of the features, but now I find it invaluable as well as a huge time-saver for printing out the finished pattern. One thing I especially like is that, when planning to build a new lamp, I can scan in a photo of that particular lamp from one of our calendars, trace over it and then try out different glass combinations. Then I print the color picture and a list of materials that I take to my glass shop.

SELLING YOUR ARTWORK

Heather Castillow: *To sell your work to the public, here are some guidelines:*

- Visit galleries that you are interested in to make sure your lamps would “fit” in the price range and also fit with the type of art that is sold.
- Call to find out what the gallery requires to show your work. Some galleries accept Tiffany reproductions, while others prefer to show original designs.
- Most galleries require photographs of your work. (Use a dark background when taking photos of your work to add to your application packet.)
- So that you don’t find yourself waiting for a reply, find out if the gallery only accepts and considers applications at specific times of the year.

Preparing your application packet

Studies show that for every 10 well-organized packets that are sent out, at least 1 to 2 positive responses are received.

- Your application packet should include a cover letter stating the reason you are writing, what you like about their gallery and why you would like your lamps to be shown at their location. The letter should include words of appreciation for their time in considering your work and information about how they can get in touch with you.
- The packet should include a resume stating your background in glass, length of time you’ve held a business license and your membership in ASGLA. If there are any public places where your work can be seen and if you have received awards for your work, include them in the letter. *Use high quality paper with a professional-looking letterhead for your cover letter and resume.*
- The packet should include slides and/or photos of your work.
- Two business cards should be included in the packet.

For more information, contact your State’s Association for the Arts. These Associations are federally funded to help artists and crafters find places to display their art.

DESIGN FEES, CONTRACTS & BIDS

Joan Bengtson: Many times clients don't consider the time and effort spent on designing to be part of the project. Early on in my glass career, this happened, but I finally realized that I wasn't even making minimum wage, mainly because I would underprice in an effort to get projects. For my studio to survive, I had to take on a more business-like approach. Now, I ask for a down payment - in an amount that covers most of the cost of design time. The only time I provide more than one design is when the client is willing to pay for this "extra". (This tells me how serious they are about wanting my work.) When I get "up front" money, I do everything to please the client - no matter how many re-drafts of the design it takes. If the time taken turns out to be substantial, I slip the extra time into the final bid as a miscellaneous cost. I also write a clause into the contract to the effect that I reserve the right to add charges for any changes the customer makes that add to my time or materials. Not all projects are accepted by the customer, however, these designs are in my "rejected" file and could possibly be used in future work.

SAMPLE CONTRACT

This agreement is entered into as of the ____ day of _____, _____ by and between _____ (“Seller”) and _____ (“Customer”).

The

Seller and the Customer are sometimes collectively referred to herein as the “Parties” and, individually, as a “Party”.

NOW, THEREFORE, for and in consideration of the mutual agreements of the Parties contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, intending to be legally bound, hereby agree as follows:

1. The Seller shall make for the Customer a stained glass _____ with the specifications and

description as set forth on Exhibit “A” attached hereto (the “Product”) THE PARTIES INTEND

THE

DESCRIPTION OF THE PRODUCT CONTAINED HEREIN TO BE FOR PURPOSES OF IDENTIFICATION

OF THE GOODS TO THIS AGREEMENT AND NOT TO BE MADE PART OF THE BASIS OF THIS

BARGAIN OR A REPRESENTATION OR WARRANTY OF THE EXACT SPECIFICATIONS OF THE PRODUCT.

2. Upon execution of this Agreement, Customer shall deposit with the Seller

\$ _____ as a nonrefundable deposit. Upon delivery of the Product, the deposit will be applied against the Purchase

Price. THE PARTIES AGREE THAT THE ACTUAL DAMAGES THAT MIGHT BE SUSTAINED BY THE SELLER BY REASON OF THE BREACH BY CUSTOMER TO TAKE DELIVERY AND PAY THE PURCHASE PRICE ARE UNCERTAIN AND WOULD BE DIFFICULT OF

ASCERTAINMENT, AND THAT THE DEPOSIT WOULD BE REASONABLE COMPENSATION FOR SUCH BREACH. THE PARTIES HEREBY AGREE THAT SUCH SUM SHALL BE LIQUIDATED DAMAGES, AND NOT AS A PENALTY, IN THE EVENT OF SUCH BREACH.

3. The price for the Product is \$ _____ (“Purchase Price”). The full amount of the Purchase Price, less the deposit, will be due upon delivery of the Product. The Product shall be available for delivery

to Customer upon completion by Seller. Seller has made no representation as to when the Product will be completed.

4. SELLER HAS MADE NO AFFIRMATION OF FACT OR PROMISE RELATING TO THE GOODS BEING

SOLD THAT HAS BECOME ANY BASIS OF THIS BARGAIN. FURTHER, SELLER HAS MADE NO AFFIRMATION OF FACT OR PROMISE RELATING TO THE GOODS BEING SOLD THAT HAS CREATED OR AMOUNTED TO AN EXPRESS WARRANTY THAT THE GOODS WOULD CONFORM TO ANY SUCH AFFIRMATION OR PROMISE.

5. THE PRODUCT DESCRIBED IN THIS AGREEMENT IS SOLD ON “AS IS” BASIS, AND SELLER DISCLAIMS AND CUSTOMER WAIVES ANY EXPRESS OR IMPLIED WARRANTIES WITH RESPECT TO THE PRODUCT.

8. The Parties agree that, in the event of any failure, defect, or malfunction of the Product, the only remedy available to the Customer shall be a refund of the Purchase Price or repair or replacement of the defective product, at the Seller’s sole and absolute discretion and in the event of a default by Seller hereunder, the only remedy shall be a return of the deposit to Customer.

The Parties agree that all claims by Customer under this Section 6 must be brought to the attention of the Seller by written notice

within ____ (days/months/years) of the delivery of the Product to the Customer. Failure to timely bring any such claim under the terms of this Section 6 will result in a final waiver of any such claim.

7. This Agreement constitutes the entire agreement of the Parties, and supersedes all prior OR

contemporaneous oral or written understandings regarding the subject matter hereof.
8. This Agreement shall be construed and enforced in accordance with the State laws of

IN WITNESS WHEREOF, this Agreement has been duly executed by the Parties as of the date first above written.

"SELLER"

By: _____
Name: _____
Title: _____

"CUSTOMER"

WORKSHOPS

RENOVATIONS

Lynne Salcetti: We've had a workshop in a bay of our garage for about 20 years - this is a great option to having to working within the house. We remodeled one bay by taking off the garage door and replacing it with a slider. We covered the concrete floor with indoor/outdoor carpeting, added a combination air-heater and walled the workshop off from the remainder of the garage.

Ernie Downey: When I remodeled my work area, I built in a metal dryer vent pipe to the ceiling and added a vented overhead hood to take care of solder fumes. I wired an outlet to a wall switch near the work bench so I could easily activate the venting. I also built in plenty of outlets and added a huge double fiberglass sink.

Jennifer Buckner: My husband built me an 8'x4' workbench - the top of which is supported on each side by storage cabinets. It has slots for glass under the center of the workbench between the cabinets. All around the perimeter of the studio and up against the walls are more work surfaces - the same size as the workbench. Under these surfaces are roll-out drawers - 4' deep and 3.5' wide, of different configurations. Some drawers have shelves and others have lengthwise slots. One is arranged as a file cabinet and some have deep drawers. I bought a small microwave stand that has shelves under it. I can roll this stand around my workshop. To make cutting easier on my back, the workbench is higher than a standard counter and we added a pad of very dense 2" thick rubber matting to the area that I stand on while I work.

GLASS STORAGE RACKS

If your glass is propped up against walls, laying on the floor, or stacked in piles, here are some storage ideas for you to try out!

Brian Hitchcock: The glass storage racks I've built over the years are made of plywood sheets and strips of wood to space the vertical pieces. If you want to go all-out, you can cut grooves in the top/bottom pieces of (spacer) wood. I also use plastic bins that I purchased from either WalMart or Target to hold smaller pieces of glass I want to keep.

Nancy Pimental: We like to put formica on the bottoms of our glass racks so the glass will slide easily. We've had the same racks in our studio for over 18 years and the formica holds up very well.

HOW TO BUILD A SANDBLAST CABINET

Jennifer Buckner: If you can find one of those old printer covers they used to use in offices when printers were really noisy, you'll find that it works well as the basis for a sandblasting cabinet. After I salvaged such a cover, my husband modified it for me. He put the cabinet up on a one foot base, cut two holes in the front wall, attached sand-blast gloves (rather like a newborn incubator) and added a rigid clear plastic sheet inside the lift-up plastic hood to protect it from blow-back etching. He also installed a small lamp under the "roof" and cut another hole in the side for hoses and nozzle. He cut another hole to which he attached a vacuum hose (running to a Shop-Vac) to remove the air-borne dust. It worked out well.

GRINDING STATION SETUPS

Brad Berglund: I have two grinders...the smaller one has only the smallest bit on it that never is changed and next to it is the large grinder. I use grids 'under' and two connected splash shields. What really helps is the worktable that I built to fit my height so that little bending is necessary. The station has an overhead light and a clip-on spot light for the grinders. I stand on an anti-fatigue mat that has holes in it for glass chips to fall through, so my walk surface is clear.

Joyce Mattson: I use an old 10 gallon fish tank - turned on its side - to hold my grinder. This works great, so no more mess all over everything and I don't have to worry so much about getting hit by flying glass.

Nancy Pimental: To save on repairs and/or having to replace a grinder, remember that a grinder head moves when you push too hard on it. Sooner or later, this will bend the shaft. Pushing too hard also slows the wheel, so you aren't actually grinding more off the glass when you apply more pressure to the wheel.

Jennifer Buckner: I always stand when I'm grinding, and that's hard on the back and knees after an hour or so. A few years ago, I bought a piece of very dense rubber matting (made from old tires) that is used in horse barns. It's about 1 1/2" thick and gives me a bit of cushioning. It came in a 4'x6' sheet, so I cut it in half. I also have a small block of wood, about 4" high on which I can alternately rest each foot. This block gives me even more relief from the pressure of standing still for a long period of time.

Joan Bengtson: The stand for my grinder is made of sheet aluminum and has a tilted top so that the grinder can sit on it at the right ergonomic height for me. Since it is on an angle, it didn't hold water to the grinding head, so my husband drilled a hole at the front edge of the reservoir and siliconed a short length of aquarium tubing to drain into a gallon size tub underneath. I keep the tub about 3/4 full of water, placed an aquarium pump in it (piped with an adjustable flow valve) that returns water to the grinding head. Because of this large quantity of water, it doesn't need to be cleaned out very often. I also clamped a spot light with a flexible arm to this setup. When I step on a foot switch the grinder starts, the pump starts, and the light turns on!

Nichole O'Neill: I decided to make my grinding station more convenient by drilling a hole in my old Wizard grinder and putting a drain in it. Then I added a foot switch that allows me to tap the grinder on and off. So that I no longer have to bend over it, I've raised the height of my grinder so that it is at my standing level. A lamp is clamped to the bench now, and directed right over the grinder. Positioned on four sides of the grinder are plexiglass shields that are open at two corners for my arms to fit through. The shields protect me from getting splashed with ground glass."

Joni Tornwall: My grinder has a smaller work surface, so my husband found an old work surface and used a Dremel tool to make the bit hole a little larger. Now I can use a 1" bit if I want to. I worried that it might stress the motor, but found out it wasn't the case.

ORGANIZE WITH USEFUL GADGETS

Joyce Mattson: My workroom is finally cleaned and organized. I went to

WalMart and looked through their housewares and paint departments for things that might make life easier. I found some plastic things that are usually attached to the inside of your undersink door to hold cleansers, etc. and attached some to the back side of the backboard of my workbench. This gets the clutter of patina bottles etc. off my work space but still they are handy. Then I found some long narrow paint trays that have slots to mount on nails and hung them on the front. That way I can sweep glass chips into them as I cut and empty them later. (I had always envied Walt his hole in his workbench with the wastebasket underneath.) I hung broom, dust pan and metal square, etc. on nails on the side of the bench and bought some large stackable plastic boxes with lids and labeled them "Bevels", "Mosaic Supplies", "Kaleidoscope Parts", "Small Projects", etc. and have them under and to the sides of the bench. Small shoebox sized plastic boxes with lids hold an assortment of tools and other supplies. A silverware tray holds my groziers and most used tools. I put the patterns and books in folders by subject in a two drawer file cabinet. Lampshade molds are stacked inside each other upside down and are also under the bench. Wooden frames are now in the closet and lamp bases are on the window ledge. Large pieces of glass are in two wooden crates rescued from my glass shop's back alley. Medium sized squares are upright in heavy cardboard boxes. Alas, the smaller pieces are still overflowing the cardboard flats on shelves, but at least they are organized by color. My computer chair swivels from the card table cutting surface - to the grinder - to the light table and to the saw. All flat surfaces are freshly lined with ceiling tile. For one small instant in time last night, it was beautiful. Then I started cutting the leaves for the small rose shade. Sigh. Oh well, change is the only constant, right?

PHOTOGRAPHING LAMPS

SETUP FOR SHOOTING LAMPS

Don Conti: If you follow these basic steps in setting up to photograph your lamp, you should have a successful “shoot”

1. Pin or tape the backdrop (preferably a medium gray color) to a wall, and “scoop” it onto a table - No wrinkles, no folds, no creases! (Use a stiff brush to remove wrinkles from the material on the backdrop and table.)
2. Center your lamp on the table’s backdrop. At the bottom of the lampbase, cut a small hole in the backdrop through which you can pass the lamp cord. Make sure that neither the cord nor the hole can be seen from camera position. Your lampbase should be fitted with 100 watt bulbs.
3. Plug the base into an extension cord that has been fitted with the important “dimmer switch”. With the “dimmer” you will be able to control the light level without having to change the wattage of your bulbs while you experiment with light intensities. (Many lamp slides that have been sent to us for calendar consideration cannot be used because of too much light intensity. In these lamps, the colors are “washed out”, so EXPERIMENT.)
4. Use 100 watt bulbs in three hooded fixtures. Make sure that the fixtures are out of camera range; position one directly above your lamp and the other two on either side. Check from the camera position to be sure you aren’t getting reflections off your lamp from these light fixtures. Check to see that the vase cap is lit and, if the base is to show in the slide, make sure that the hooded side fixtures are lighting it properly.
5. Turn on the lights in your lamp and check for “hot spots”. Mask any hot spot with white paper cut to the size of the offending area, and attach the paper to the inside of the lamp with tacky wax or clear tape. It is best to mask hot spots rather than lowering the light level to eradicate them. The lower light might cause “dead” spots in other areas. Now, your lamp is ready for photographing.

HOW I USE MY DIGITAL CAMERA

Brian O’Donovan: A digital camera should be at least 3.2 megapixels. At 3.2 megapixels you can obtain the following prints:

a 10 x 8 inch print at 200 dpi

a 8 x 6 inch print at 250 dpi

a 7 x 5 inch print at 300 dpi

•The camera should have these capabilities:

Manual exposure

Switching the flash off

Tungsten correction

A ten second timer on release button

Different focus settings (centre, weighted, etc.)

Macro

Procedure:

•I set the camera to flash off, manual, tungsten, ten second timer, spot focus and macro.

•I also set it at maximum resolution at the lowest ASA rating.

The setup for photographing:

- I used two lamp stands which could take 100 watt spot lamps. Ideally the spot lamps should be fitted with what photographers call snoots. This is a tube that keeps the light output to a small area. As an alternative, use yourself and willing helpers to hold cardboard. (Don uses a board set on hinges. One light is set to one side of the camera which must be on a tripod. This light will be set at the height of the base and will be focused on the base.) You either hold a card with a hole in it or use the snoot to make sure that no light is on the lamp base itself. The idea is to get a small area of light just lighting up the base. You will need to experiment (as Don points out in step 4 in "Shooting Photos of Lamps") to get the correct amount of light on the base.
- The second spot lamp should be set higher to focus on the cap. Again you will use cardboard or a snoot to make sure that no light is on the lampshade itself. Again a dimmer on this spot lamp would be useful.
- Put a 60 or 100 watt bulb or bulbs in your lampshade or use a dimmer as described by Don. Choose the bulb to get a bright sparkling lampshade but no hotspots. If you have three bulbs put two in front on either side and one at the back. If you use a harp put the harp sideways, i.e. the uprights on the right and left.
- Prepare the backdrop. (see step 1 in "Shooting Photos of Lamps")

The most important aspects:

- Work in a darkened room so that the only light will be your two spots and the lampshade itself. No other light should fall on the lamp. (As soon as light falls on your lamp, you will be photographing the outside and not the light shining through.)
- I set up the camera so that the centre focusing indicator was on the lamp itself. (However, using center focusing did not seem to make an awful lot of difference over matrix or manual focusing.)
- Set the camera to its smallest aperture (mine is f8) and try a range of pictures at .4, .5, .6 and .8 of a second. That seems to be the best range. You would use the timer to make sure that there is no camera shake and to give you time to make sure that your pieces of cardboard are in the right place.

The variables:

It seems that the variables we need to control are:

- The amount, direction and span of the light on the cap and the base.
- The amount of light through the lamp (to give sparkle without major hotspots).
- The amount, if any, of light on the front of the lamp.
- The exposure itself.

PHOTO HINTS

Walt Makos: There are different ways to reduce the glare of the light bulb - one is to add a second glass layer to the lamp and another is to sandblast the backside of the glass in the problem area. One can etch the glass - either mechanically or with chemicals. I found that sandblasting works best and produces a frosted surface that softens the hot spots of the shade.

Larry Cartales: One way to decide if "hot spots" in your lamp are really a problem is to install 2 white bulbs on one side of the lampbase and 2 clear bulbs

on the other. Look at your lamp with either the white or the clear bulbs turned on to see if you are really not pleased with its look. Before you go to the trouble of sandblasting or even etching, you might try putting a piece of (frosted) scotch tape or a piece of mylar over the “trouble” area of the lamp to see if a light frost might make the difference. If it does, etching cream might be the simplest solution.

Mike Barnes: I just finished another lengthy photo session with my Grape Chandelier. The colors in the lamp cover a broad spectrum and, therefore, caused lots of problems. The film I use is 100 Elite Chrome (previously named Ektachrome). Like Don and Chaz, I have a Cannon AE-1. I stayed in the manual mode and found that if I used 100 watt bulbs in the lamp and positioned my camera slightly above the center of the lamp, I was able to achieve the right color mix. I got good results at f stops 8 and 11 (different views) at 1 second shutter speed. I also tried 1/2 f stop intervals. I put the external side lights on a dimmer and used it at about 3/4 power. I also used a blue filter. I had an additional problem because the chandelier was doing what chandeliers do as they hang from the ceiling, but I won't go into that! I am certainly not a professional...I'm just persistent.

Kevin Hendon: While Dave Hammond and I were in the middle of a photo session the other day, we discovered that one of the nasturtium petals in my lamp seemed rather “hot” compared to the rest of the lamp and needed to be calmed down. There wasn't any white paper handy for us to try the “paper” trick, but Scotch tape was on hand, so we ripped off a piece, taped it to the inside of the lamp over the hot petal and bingo! we did our own “etching” job! Worked pretty well.

Chaz Smith: Nothing is considered cheating in order to get a good photo! You can change lighting by adding more bulbs, use different bulbs or position extra bulbs; shim the shade up to change bulb position, use various bulbs in different socket positions or use a dimmer switch. You might find that a long aquarium bulb might help spread the light since the filament in these bulbs is several inches long. You can change camera position or even tape paper inside the lamp in order to shade certain areas that show hot spots. Spend the \$10 for the blue filter for your camera. It costs no more than a roll of film and developing does and it's the “tried and true” method. As you may notice, Don's photos tend to be among the best in the calendar, so why mess with success! I use a Cannon AE-1 camera. I set the shutter speed and it picks the f stop, automatically accounting for the blue filter. Even though, theoretically, it is good to bracket shots (+/- an f stop), I've found that the ones where the camera picks it are always the best. Of all the slides I send in, these are invariably the ones that are chosen to be shown at the slide show meeting. Focus is critical. To get a good depth of field, your f stop should end up at least 5.6 to 8. Focus in at the center of the lamp, rather than at the nearer rim. Many zoom lenses sacrifice optical trueness for the ability to zoom. This lense will cause straight lines to look curved - especially at the edges of the photo. The standard 50mm lense that comes with many cameras is probably a good bet. I might be inclined to use a longer lense and move back from the lamp rather than a wide angle to get closer. Get royal blue

felt from a craft store for your backdrop. Spend at least 2 hours setting up before shooting. If you can do that in less than 2 hours, you're either not doing it right or you're in Don's studio! Remember, your eye corrects for and removes all kinds of things you don't want to see. The slightest glare than you barely see will really show up in a photo. Finally, allow no hot spots in your lamp or wrinkles in your backdrop to show. Have the lamp fill the frame and try to have the base and external hardware lit without light glaring off the outside of the lamp.

By the way, the blue filter on the camera is to correct for the fact that the film is designed to be used in sunlight. Since incandescent light is not full spectrum light, photos tend to have a yellow cast. The blue just corrects for that and makes the photo look more like how we perceive the actual lamp after our mind says "white is white". It does not tint the photos blue - white will be white. No filter is necessary if you are shooting outdoors. Ever notice how nice a lamp looks if you hold it up to the sun? The blue filter helps it look a bit more like that.

RESOURCES

USEFUL CONTACTS

ASGLA

5070 CROMWELL DR. NW, GIG HARBOR WA 98335

PHONE: 253-265-3646

E-MAIL: asgla@comcast.net

WEBSITE: <http://www.asgla.com>

FAX 265-3728

BRASSPLATE ENGRAVING CO.

1325 MONROE STREET N.E.

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FAX (503)238-9963

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FAX (414)892-4332

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FAX (724)628-5060

WEBSITE youghioghenyglass.com

GLASS MAGAZINES

- **Common Ground: GLASS**, (the magazine of The International Guild of Glass Artists). 1025 Yorkshire Rd., Grosse Pointe Park, MI 48230
<http://www.igga.org/>
- **Glass Art**: Glass Art, P.O. Box 260377, Highlands Ranch, CO 80163-0377 Glass Art <http://www.glassartmagazine.com/>
- **Glass Craftsman**: Glass Craftsman, P.O. Box 678, Richboro, PA 18954-0678 <http://www.glasscraftsman.com/>
- **Glass Patterns Quarterly**: Glass Patterns Quarterly, 8300 Hidden Valley Road, P.O. Box 69, Westport, KY 40077 <http://www.glasspatterns.com/>
- **Neues Glas/New Glass**: GLP International, P.O. Box 9868, Englewood, NJ 07631-6888
- **Stained Glass**: Stained Glass, 6 SW Second St., Suite 7, Lee's Summit, MO 64063-2352. The official quarterly of The Stained Glass Association of America

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VIDEOS

- "Louis Comfort Tiffany Remembered" with Hugh F. McKean, Charles Hosmer Morse Foundation, Winter Park, Florida
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