

Etched Glass Christmas Ornaments

An Introduction to Sand Blasting & Etched Glass



Andre Bally
December 4 – 10am to 5pm

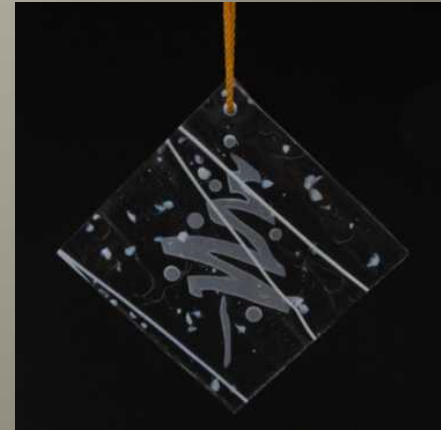
Introductions:

- Who am I?
- Where are we?
- Who are you?
 - what experience do you have?
 - what are your expectations?



What we plan on accomplishing?

- We will learn the Safety Procedures relating to the process of glass etching.
- We will learn the materials and equipments.
- We will learn four different
- techniques for etching glass including:
 - acid etching,
 - light sand blasting or frosting,
 - deep etching and
 - stage blasting.
- **What you will be taking home:**
- one acid etched ornament, three sand blasted ornaments.



SAFETY:

Protective Clothing:

Close toed and closed heel shoes

Wear your eye protectors

Wear your ear protectors

Wear your dust mask

Working with Glass:

Be Aware of Your Surroundings

X-acto knife technique: always be aware of where your fingers are. Always cut away from your fingers.

DON'T BREATHE DUST FROM BLASTING BOOTH!!



Equipment:

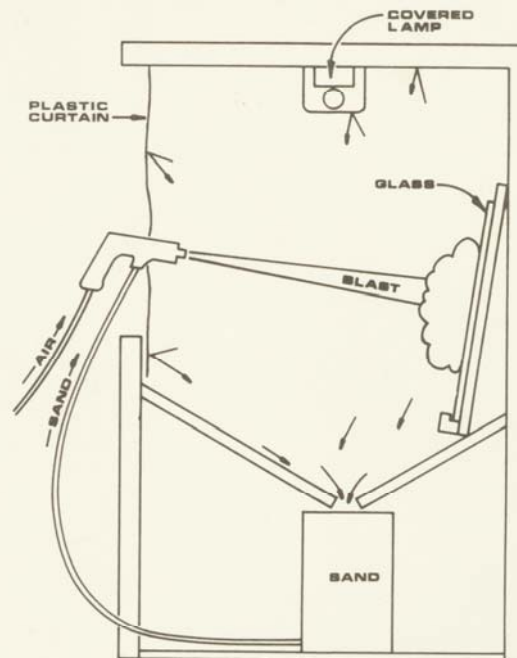
Sandblasting cabinet and Compressor



Equipment: Safety Glasses:, dust mask, work gloves, latex gloves, X-acto knives, sandblasting cabinet.

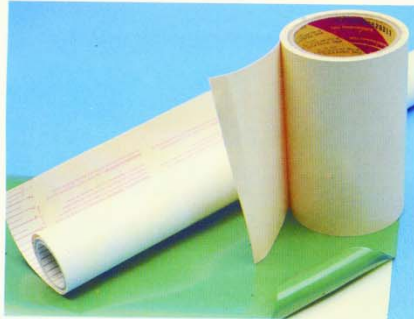
Glossary

ABRASIVE MATERIAL	Garnet, aluminum oxide, crystal silica or other sand-like substance used to abrade the surface of glass.
ACID ETCHING	Method of frosting the surface of glass with acid.
ALUMINUM OXIDE	Moderate grade abrasive material used for sandblasting.
ANIMAL GLUE	An old-fashioned glue made from animal hooves, bones and skins used for chipping glass.
BEVEL	To grind and polish the edges of glass at an established angle.
BLAST CUTTING	To cut through glass by means of sandblasting.
CARVING	To sandblast a three dimensional design in glass.
CERIUM OXIDE	An optical quality polishing compound used in the beveling process to buff out scratches.
COPPER FOIL TECHNIQUE	A method of assembling stained glass pieces.
COPPER WHEEL ENGRAVING	A highly specialized method of cutting designs into glass.
CRYSTAL SILICA	Inexpensive grade abrasive material used for sandblasting.
DESICCANT	A substance that has a high affinity for water and is used to absorb moisture.
DOUBLE BLAST ENGRAVING	Blasting designs on glass from both sides. To carve, cut or etch onto glass.
FLASHED GLASS	Antique glass, usually handblown with two or more separate colors fused together.
GLUE CHIPPING	A process whereby the glass surface is decoratively chipped with the use of animal glue.
HYDROFLUORIC ACID	A colorless, corrosive, highly poisonous aqueous solution of hydrogen fluoride, used to etch glass.
NON-RECOVERY SYSTEM	A sandblasting set-up, usually a small room or a booth designed to recycle used abrasive material.
RECOVERY SYSTEM	A sandblasting set-up, usually a small room or a booth designed to recycle used abrasive material. (See diagram)
RESIST	A mask or protective covering used to prevent abrasion from sandblasting or acid etching.
SANDBLASTING	A blast of air carrying sand at high velocity to etch glass surface.
SILICON CARBIDE	A bluish-black crystalline compound, one of the hardest known compounds, used for sandblasting.
STAGE BLASTING	Sandblasting a design to two or more different and distinct depths.

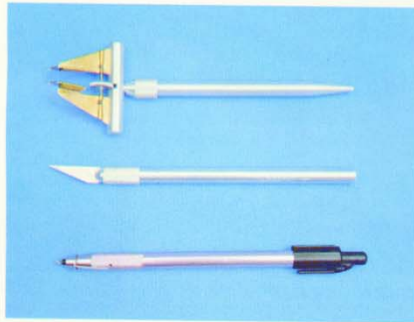


SIMPLE SANDBLASTING BOOTH WITH RECOVERY SYSTEM

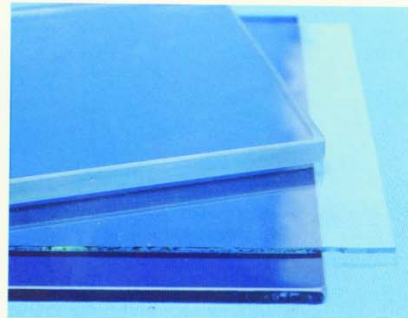
Materials:



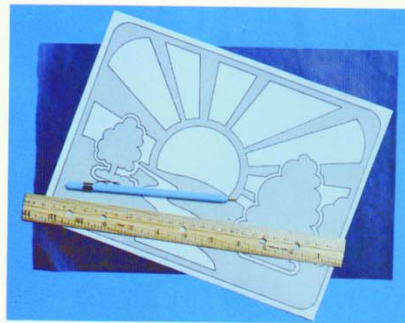
RESISTS — There are several choices of resist material. A-21 Contact[®] paper is suitable for very light sandblasting and acid etching. Three layers are necessary for stage blasting. A heavy masking tape ranging in widths to 24" is also available. Buttercut[®] is the best resist available and is recommended for stage blasting and carving. It is expensive, but well worth the investment as it holds up well under the stress of deep blasting.



KNIVES — A very sharp knife is needed for cutting resists. There are a variety available. From top to bottom — Adjustable double-bladed knife for cutting parallel lines, hobby knife with pointed blade is good for detail, swivel blade is excellent for cutting curves.



GLASS — Sandblasting can be done on most any type of glass. There are many different effects possible when using flashed glass, colored and tinted glass, antique glass and mirrors. Glass is also available in a variety of thicknesses. Carving and stage-blasting can be very dramatic on glass 3/8-1/4" thick.



CARBON PAPER, PEN, RULER AND PATTERN — Carbon is used to transfer the pattern onto the resist. A pen and ruler are also used for this purpose. Select your pattern and make any necessary alterations. (See pg. 38.)

SANDS AND ABRASIVES — For successful finished projects, the type of abrasive material you choose is an important consideration. With experience, you will learn which is best suited for your purposes.

Some of the abrasives mentioned below are available at home improvement centers. For additional sources, check in the Yellow Pages under "Sandblasting."

CRYSTAL SILICA is the most common blasting medium. It is good for general blasting but it dulls very easily. Because it is so inexpensive, it is good for use in non-recovery systems.

GARNET is a little more efficient but also dulls after several uses. Garnet is a good compromise between Silica Crystal and the expensive abrasives.

ALUMINUM OXIDE is a very popular abrasive. It is more expensive still, but is a much sharper crystal and reduces the blasting time considerably.

SILICON CARBIDE is the choice of the professional abrasive artists. This shiny black crystal is considered the ultimate in abrasives. It is very expensive, however it is well worth the price if you intend to do much blasting. Because of its molecular structure, as the crystals fracture they become finer and sharper. Therefore, dulling is not a problem. A recovery system is necessary because of the cost of the material.

GRITS — All abrasives are available in a variety of grits. Larger grits produce less friction and less heat and are easier on your resist.

60-80 mesh is a course grit—good for cutting.

100 mesh is a medium grit—general blasting and carving.

150-200 mesh is fine grit—good for shading.

Armour Etch Cream, masking material, vinyl or buttercut, glass ornaments (flat glass clear or tinted), abrasive.

Four Methods of Glass Etching:

Steps for Acid Etching:

- Decide on a pattern or template
- Clean your glass thoroughly**
- Cut and apply a stencil
- Apply Acid Cream, wait an appropriate time
- Wash off cream
- Clean and dry ornament

Steps for light sand blasting or frosting:

- Decide on a pattern or template
- Cut and apply a stencil
- Lightly Sand blast exposed glass
- Clean and dry ornament

Steps for deep sand blasting or glass carving:

- Decide on a pattern or template
- Cut and apply a stencil
- Blast exposed glass to desired depth
- Clean and dry ornament

Steps for Stage blasting or glass carving:

- Decide on a pattern or template
- Cut and apply a stencil
- Blast exposed glass to desired depth
- Remove second stage vinyl, Blast exposed glass to desired depth
- Clean and dry ornament

Acid Etching

Acid etching is a modified method of the original acid dip technique where the glass was immersed in a vat of hydrofluoric acid. This is an extremely dangerous process and is no longer a popular practice. The acid etching cream available today is mild by comparison, however, it is still a very toxic chemical and should be respected as such. Acid etching can be simple and fun if all precautions are followed carefully.

NOTE: Use acid etching cream in well ventilated area as breathing fumes may be hazardous. Avoid contact with eyes, skin and clothing. Follow all label precautions carefully. Also, protect counter tops, floors, sinks and other household surfaces.



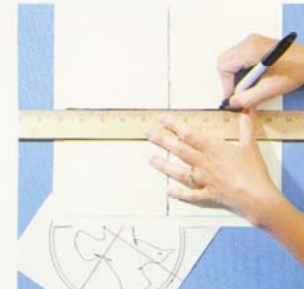
MATERIALS. Read through all steps and gather supplies before beginning. You will need: glass, A-21 Contact® paper for resist, carbon paper, sharp knife, pen and marker, ruler, tape, paint brush and rubber gloves. Acid etching cream is available from most stained glass and craft stores.



STEP 2. APPLY RESIST — Cut two pieces of Contact® paper 1" larger than the glass. Apply to both sides of glass. Press resist down with your hand as you peel off the backing to avoid trapping air. Rub out any remaining air bubbles.

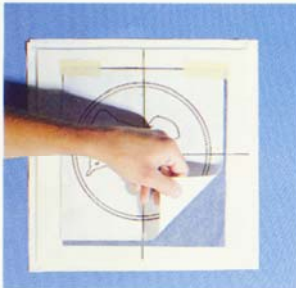


STEP 1. CLEAN GLASS — The glass must be very clean before applying resist. Smudges or finger prints may cause the acid to etch unevenly or cause the edges of the resist to leak.



STEP 3. CENTER PATTERN — Divide the covered glass into quarters using a ruler and marking pen. Divide the pattern in the same way. When transferring the design onto the resist, these lines will be used to position and center the pattern.

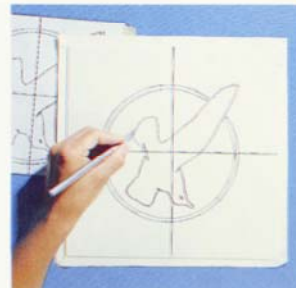
Acid Etching Technique continued



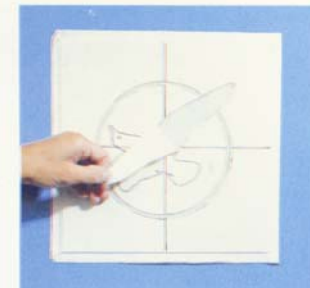
STEP 4. CARBON PAPER — Carefully match the lines on the pattern with the lines on the covered glass. Insert a piece of carbon paper between the pattern and glass with the carbon side toward the resist. Tape in place.



STEP 5. TRANSFER PATTERN — Using a pen, transfer the pattern onto the resist by firmly tracing the entire pattern. Before removing the pattern, lift up the bottom and check to be sure that you have traced over all lines.



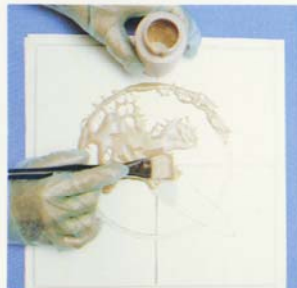
STEP 6. CUT RESIST — Remove tape, pattern and carbon. Cut through resist along all lines with a very sharp pointed knife. When knife blade dulls, replace it. A dull blade tends to drag and pull up edges of the resist. This may cause leakage.



STEP 7. REMOVE RESIST — Determine which areas of the pattern you want to be etched. Carefully remove the resist from those areas. Corners or small pieces may be picked up with the sharp tip of the knife.



STEP 8. CLEAN GLASS — Using a small piece of lint free towel or a cotton tipped swab, clean all areas to be etched with glass cleaner. Make sure the glass is totally free of fingerprints or residual adhesive.



STEP 9. APPLY ACID — When working with acid etching cream, always work near a water source and wear rubber gloves. Apply the etching cream quickly and evenly with a brush. Let stand for the amount of time designated on the label.



STEP 10. RINSE ACID — When the specified time has passed, rinse off the acid. Use a medium water pressure and rinse well. If not rinsed completely, the diluted acid may etch unwanted areas of glass. **CAUTION:** Acid may damage sink surfaces. Rinsing outside is recommended.



STEP 11. CLEAN GLASS — When you are certain that all traces of acid have been rinsed off, carefully remove resist. Rinse glass again with water and then clean with glass cleaner.



Basic Sandblasting Technique

Sandblasting is really exciting to do! It is particularly rewarding because it is possible to achieve professional results with very little experience. Start with something simple and work up to more difficult projects. If you choose an extremely detailed design for your first attempt, take the extra time necessary to practice cutting with the hobby knife before you begin cutting your resist. It is well worth your investment of time to cut your resist very carefully and accurately. Remember, the success of your finished project is directly related to the quality of your prepared resist. Follow the step by step instructions on the next page and have fun!

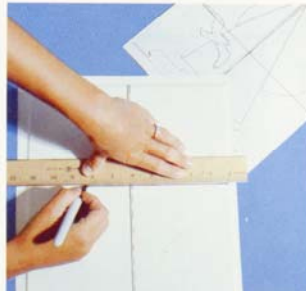
(Left) As illustrated by the projects shown here, the effect of a design may change entirely when different areas of the same pattern are sandblasted. Examine your pattern before cutting the resist to determine which areas of your pattern you want to blast.

CAUTION: ALWAYS WEAR EYE PROTECTION TO PROTECT FROM AIRBORN DUST AND SAND. ALSO, IT IS VERY IMPORTANT TO WEAR A DUST MASK TO PREVENT A SERIOUS LUNG DISEASE CALLED SILICOSIS, CAUSED BY INHALATION OF THESE DUSTS.

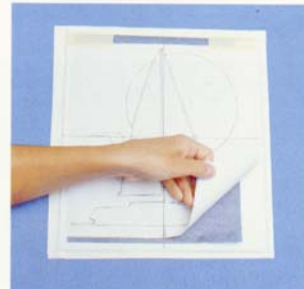
Basic Sandblasting Technique continued



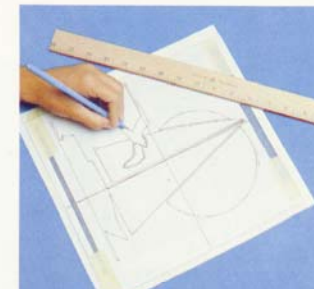
STEP 1. APPLY RESIST — Cut two pieces of resist that measure 1" larger than the glass. Apply to both sides of glass. The back is covered to protect from scratches. If using Buttercut® the back need only be covered with Contact® paper or tape.



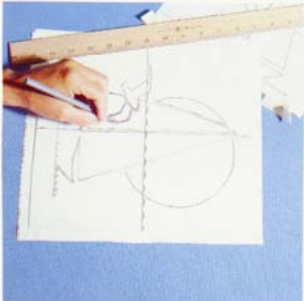
STEP 2. CENTER PATTERN — Divide covered glass into quarters using ruler and marking pen. Divide the pattern in the same way. When transferring the design onto the resist, these lines will be used to position and center the pattern.



STEP 3. CARBON PAPER — Center the pattern on the glass by using the lines as positioning guides. Insert a piece of carbon paper between the pattern and the resist. Tape securely in place.



STEP 4. TRANSFER PATTERN — Using a pen, transfer the pattern onto the resist by firmly outlining the entire pattern. Before removing pattern, lift up the bottom and check to be sure you have traced over all lines.



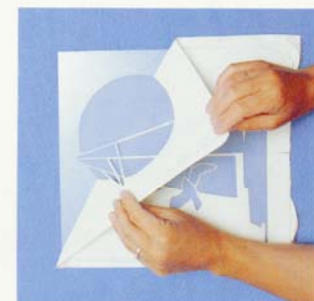
STEP 5. CUT RESIST — Remove tape, pattern and carbon paper. Cut through resist along all lines with a sharp, pointed knife. When blade dulls, replace it with a sharp one. A dull blade may loosen the resist from the surface of the glass.



STEP 6. REMOVE RESIST — Determine which areas of the pattern you want to blast. Carefully remove resist from those areas. Use the tip of the blade to help peel up the small edges. If using Contact paper® or masking tape, rub down all edges before blasting.



STEP 7. SANDBLAST — For a uniform blast, hold the nozzle 8-10" from the glass. After some experience, you may want to change this distance to achieve different effects. Be careful at close range, however, as the friction can melt the edges of the resist.



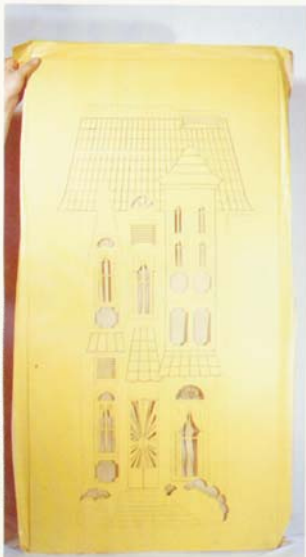
STEP 8. CLEAN-UP — Before removing the resist, carefully examine all of the blasted areas to assure that they have been blasted to your satisfaction. Touch up where necessary. Remove resist and run glass under water to remove the sand and dust. Finally, clean with glass cleaner.

Techniques Stage Blasting

Stage Blasting is a technique where a design is blasted to different, distinct depths. Since you usually blast a project from the back, it is necessary to visualize the design in reverse before stage blasting. The areas which are blasted deepest, when viewed from the front, will appear to be closest to you.

Although you will be blasting the project more than once, you can usually use the same resist by simply removing portions and continuing blasting. The first blast generally does not get much deeper with subsequent blasts, but it does round out. Remember to consider the thickness of your glass when you determine your deepest point.

Courtesy Glasshopper, Anaheim, CA.



STEP 1. CUT RESIST — Prepare resist as explained in the basic instructions for sandblasting. Butter-cut or triple thick Contact® paper is recommended. Remove areas to be blasted the deepest.



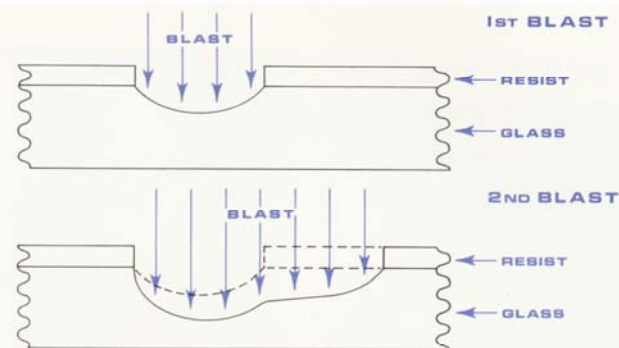
STEP 2. FIRST BLAST — Blast these first areas to the desired depth. As you continue blasting, these areas will not get a lot deeper, however they will tend to round out and blend with the next depth.

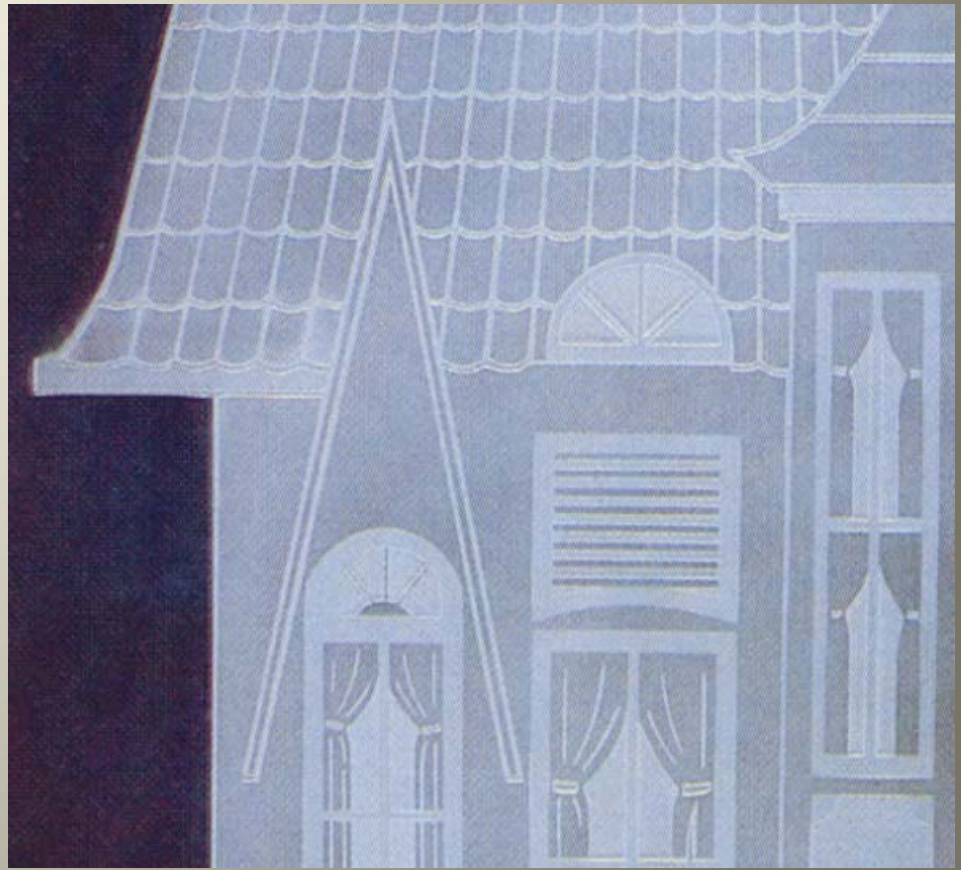


STEP 3. SECOND BLAST — Determine which areas are to be blasted next. Cut and carefully remove the resist material. Sandblast these areas same as step 2.



STEP 4. SUBSEQUENT BLASTS — Continue removing resist and blasting in this manner until the entire design has been completed.





Stage Blasted Design

Stage Blasted Design





