

# How To Glue Chip Glass

By AngelGilding.com

Glue chipping adds texture to glass. You can texture an entire sheet or create a combination of textures by applying the glue to selected areas.

**SAFETY:** When the glue chips, it comes off the glass at high pressure. It can fly several feet. It contains very sharp, almost invisible fragments of glass. It can be very attractive to pets. It is **very important** to keep your glue-chipping operation contained and away from children and pets.

## How it works:

Glue chipped glass is glass that has been etched and covered in warm, wet hide glue. As the glue cools, it attaches to the rough glass. As it dries, it shrinks and rips thin shards off the surface in a fern-like random pattern.

Etching increases the surface area and allows the glue to get a firm grip on the glass. You can etch the glass by sandblasting or with a diamond scribe. Acid etching and commercially frosted glass are too smooth for effective glue chipping. For sandblasting, use 90 to 220 grit sand, aluminum oxide or silicon carbide. Use a diamond scribe and light pressure for diamond etching.

Usually the glue leaves some areas of the etched glass unchipped. On sandblasted glass, these areas will be matte. Diamond scribe etching creates fine lines rather than a matte surface so the final piece is more brilliant. Double chipping - applying a second layer of glue over the chipped area - usually chips off any remaining matte areas. You do not re-etch the glass.

**Please Note:** Glue chipping is NOT a fast process. It usually takes at least 24 hours. If the glue is too thick (more than  $\frac{1}{8}$ "") it can take weeks to chip. If the glue is too thin (less than  $\frac{1}{32}$ "") it will not chip at all. Be prepared to take the time to let the glue do its job.

## Supplies you will need:

- The glass to be chipped
- Masking material and a craft knife
- A sandblasting set-up or a diamond scribe
- Hide glue and water
- A heat source to warm the glue
- Warm, dry air to dry the glue (desiccant or a dehumidifier)

## Mirroring glue chipped glass:

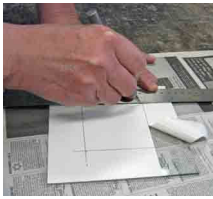
Mirroring enhances the texture of glass. Smooth glass looks smoother and the chipped areas are even more intriguing. Before you mirror newly chipped glass, cover it with wet newspaper and let it sit overnight to soften any remaining spots of glue. Then scrub the glass well with a fingernail brush to remove the softened glue before mirroring.

We discuss the science of hide glue at the end of these instructions.

# How To Glue Chip Glass

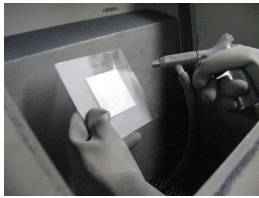
By AngelGilding.com

## Step 1: Mask the Glass



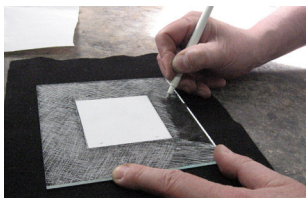
Clean the glass to remove any possible grease or oil. Mask the areas you do not want to chip with sandblasting mask if you are sandblasting the glass or any adhesive vinyl if you are diamond etching it.

## Step 2: Etch the Glass by Sandblasting – or see Step 3



Using 220 grit or less, lightly sandblast the areas you want to chip removing all trace of shininess on the glass.

## Step 3: Diamond Etch the Glass



Or you can etch the surface by scratching it with a diamond tipped scribe. Use a light pressure and keep the lines very close together.

As with sandblasting, any areas that are not chipped off by the glue will be visible in the finished piece.

## Step 4: Measure the Glue and Water



Use **3 fluid ounces of water** (90 ml) and **1 ½ avoirdupois ounces** (45 g) of glue to cover 1 square foot of glass. Measuring glue by weight is much more accurate than measuring by volume.

## Step 5: Soak the Glue



Allow the glue to soak for at least 1 hour before warming it to ensure an even final coating on the glass.

## Step 6: Warm the Glue



Warm the glue to 140° F (60°C) for at least 15 minutes. Do not go above 160° F (70°C) or it will cook. Keep the pot covered to prevent evaporation.

Our thermostatically controlled glue pots hold the glue at the correct temperature indefinitely.

### **Step 7: Pour Hot Glue on the Glass**



Pour the hot glue into a squeeze bottle and apply it to the glass at a depth of about  $\frac{1}{16}$ " inch (1.6 mm). Any glue that flows over the mask will be removed later.

If you are planning on chipping to the edge of the glass, create a dam with masking tape to hold the glue in place first.

### **Step 8: Pour Left Over Glue Onto the Backing Paper**



Pour any leftover glue onto the shiny side of the backing sheet from your adhesive vinyl. It will dry in a thin layer and can be reused later for another chipping project.

### **Step 9: Let the Glue Gel**



Set the glue-covered glass aside to cool and gel at room temperature. Proceed to Step 10 when the glue does not feel sticky and a cut made with the craft knife does not "heal". Use the leftover glue in Step 8 for testing.

### **Step 10: Cut the Gelled Glue**



Cut around your design with a craft knife and peel off the excess glue. Use acetone to clean the knife blade if it gets sticky. Peel off all excess glue and set it aside to dry completely before storing it to be used for another project.

### **Step 11: Let the Glue Dry Hard**



Allow the trimmed glue-covered glass to dry hard (cannot be cut) at room temperature and humidity before you try to get it to chip. This allows it to fasten firmly to the glass and results in a more complete chip later.

### **Step 12: Chip the Glass**

When the glue is hard, place the glass in a warm, very dry environment - about 90° F (32° C) at 10% to 20% humidity

Place small pieces (under 2 sq ft) in a sealed plastic bag with a desiccant canister. Place larger pieces in front of a warm fan or a room dehumidifier.



NOTE: The glue chips off the glass at high pressure. Glue chips are very dangerous to children and pets. Do your chipping in a closed environment. When the glue chips, it sounds like popping popcorn.

## The Science of Hide Glue

*The information on proteins was provided by Sarah Frances Field, PhD in medical genetics at Cambridge University, England.*

Hide glue consists of collagen proteins. Imagine that each protein molecule is a coiled spring covered all along its length in suckers (scientific term: electrostatic bonds). The suckers want to be stuck to something and if there is nothing else around they will stick to each other, turning the spring into a tangled blob (st: native state). When the protein is heated (st: melted) the suckers release (st: protein is denatured). When the protein is wet, the spring relaxes and becomes stringy. A warm, wet protein is very relaxed and not bound to anything. As the protein cools, the suckers stick to whatever is available. As the spring dries, it tightens and therefore shrinks – it returns to its native state.

Glue Stage	Temperature	Humidity	The “springs”	The “suckers”
1. Store	Cool	Dry	Tight	Closed
2. Soak	Cool	Wet	Loose	Closed
3. Melt	Warm	Wet	Loose	Open
5. Gel	Cool	Wet	Loose	Closed
6. Dry	Warm	Dry	Tight	Closed

To maximize each stage of the process:

- Soak the glue long enough to let the protein springs unwind and expand – at least 1 hour. Cover the container to prevent evaporation.
- Warm the glue to its melting point - 140° F. If it gets too hot, it will cook like an egg. Keep the container covered to prevent evaporation.
- Pour warm glue onto warm (not hot) glass to keep the springs relaxed and the suckers open while it attaches to the glass. Place the glass on a light table or warm it with a hair dryer or heated fan before you pour on the glue.
- Let the glue-covered glass cool slowly and harden completely at room temperature to ensure maximum bonding before chipping.
- Remove excess gelled glue with a craft knife to get a clean edge to your design. Clean the knife between cuts with acetone. Acetone and grease will destroy the protein bonds. For sharp corners, cut a line through the glue to bisect the angle. This will help to keep the glue from bridging and “over-chipping” the corners.
- Place the hardened glue-covered glass in a warm, dry location to start chipping – about 90° F (32° C) at 10% to 20% humidity. Water molecules evaporate when they are excited (warm) and the surrounding air is dry (the molecules have space to evaporate into). For small pieces, you can place the glass in a closed plastic bag with a desiccant canister. For larger pieces (more than 2 square feet) you will need a heated fan or a small dehumidifier.
- **Note:** You can reuse old dried glue almost indefinitely. Collect all your used glue in a sturdy metal can and pound it with a stick. Shake the can and most of the glass shards will fall to the bottom. Weigh out the dried glue and mix it with water to do your next piece.

AngelGilding.com  
June 1, 2009