

# HOW TO GLUE CHIP GLASS

**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, the chips come off the glass at high pressure. They can fly several feet. They contain very sharp, almost invisible fragments of glass. The process sounds like popcorn popping. The smell of the glue 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.

## SPEED

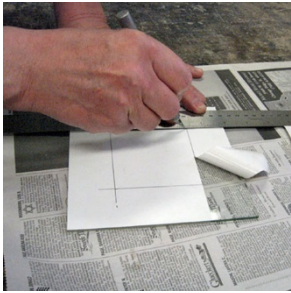
Glue chipping is NOT a fast process. It usually takes at least 24 hours. If the glue is too thick (more than 1/8") it can take weeks to chip. If the glue is too thin (less than 1/32") it will not chip at all. Be prepared to take the time to let the glue do its job.

## 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

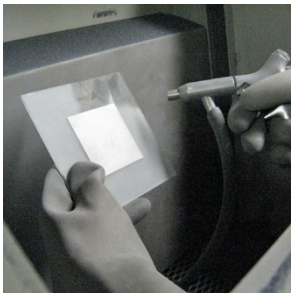
Mirroring enhances the texture of glass. Before you mirror newly chipped glass, cover it with a wet cloth and let it sit overnight to soften any remaining spots of glue. Then scrub the glass well with a fingernail brush to remove the softened glue before mirroring. Small dots of glue left on the glass will be very visible after you mirror it.



### 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 adhesive vinyl. Our adhesive vinyl works well for light sandblasting.



### STEP 2 – OPTION 1 – SANDBLAST THE GLASS

Using 220 grit or less, lightly sandblast the areas you want to chip. Remove all traces of shine from the glass.

Rinse the glass well to remove all of the dust.



### STEP 2 – OPTION 2 – DIAMOND ETCH THE GLASS

Etch the glass 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 3 – MEASURE THE GLUE AND WATER

Use **3 ounces of water** (90 ml) and **1 ½ ounces** (45 grams) of glue to cover 1 square foot of glass.

Measuring glue by weight is much more accurate than measuring by volume.



#### **STEP 4 -SOAK THE GLUE**

Allow the glue to soak for at least 1 hour before warming it to ensure that all the glue granules are evenly wet.

It will become very sticky as it absorbs the water.



#### **STEP 5 – 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 destroy the glue. Keep the pot covered to prevent evaporation.

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



#### **STEP 6 – POUR HOT GLUE ONTO 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 7 – SAVE REMAINING GLUE TO USE LATER**

Pour any leftover glue onto plastic or coated paper such as the shiny side of the backing sheet from your adhesive vinyl.

It will dry in a thin layer and can be broken up and reused on another chipping project.



### **STEP 8 – ALLOW THE GLUE TO 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”. Do not allow the glue to become too hard to cut. Cutting and removing the gelled glue ensures clean lines on your final design.



### **STEP 9 – CUT OFF THE OVERFLOW 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.

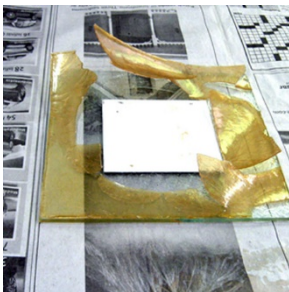
Peel off all excess glue and set it aside to dry completely before storing it to be used for another project.



### **STEP 10 – 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 chip it.

Letting the glue dry allows it to fasten firmly to the glass and results in a more complete chip later.



### **STEP 11 – 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.

You can place it in a sealed plastic bag with a desiccant canister or in front of a warm fan or a room dehumidifier.

The glue *will chip* at ambient room temperature and humidity – it will just take longer. Glue chipping can take days even in controlled conditions. Patience is required for best results.

## 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 (scientific term: native state).

When the protein is heated (scientific term: melted) the suckers release (scientific term: 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

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