



## Lesson #22 Creative Glass Casting

By George Debikey

Pâte de Verre is an ancient glass casting technique used to create solid objects that are very luminous due to the way they reflect light. This technique was practiced by the ancient Egyptians to produce beautiful amulets and gems. It was rediscovered and went through a revival period during the 1800's. Beautiful examples of that period are seen throughout the world.

"Pâte de Verre" which literally means "Glass Paste" was made using fine particles of glass in a paste form to produce the castings. In this project however, we will use large chunks of glass (billets) or pieces of sheet glass. Unlike the matte finish usually produced by the pâte de verre technique, the finished surface of this project will have an attractive satin gloss. Follow the steps in this project sheet to create your own special glass art piece.

## Supplies and Tools:

**NOTE:** The measurements in these instructions refer to the components of the AMACO® Glass Casting Kit. If you are using these instructions separately from the kit, you can apply them to any glass casting project and purchase the items individually.

AMACO® Glass Casting Kit (order no. 40055T) includes:

- 5 lbs. modeling clay
- 10 lbs. Fine Casting Mix
- 5 lbs. Clear Billet Chunks
- 2 modeling tools
- Creative Glass Casting project sheet
- Non-porous surface such as AMACO® 14" Plasti-bat® (order no. 32332L)
- Cardboard box or coddles for frame
- Mixing Bucket
- Graphite-Film Lubricant
- Dish Soap
- Glass Cleaner
- Electric kiln with computer control (Amaco/Excel GSF-670 with Glass Select Fire is recommended).

### Optional Supplies:

- Pyrometer (order no. 28825W) and thermocouple (order no. 28847X) – necessary if you are not using a kiln with computer control
- Fine Casting Mix, 10 lb. (order no. 40075V)
- Clear Billet Chunks, 2 lbs. – order no. 40070J
- Casting Glass Tiles – Lemon Chiffon (order no. 40071M), Cobalt Blue (order no. 40072N), Spearmint (order no. 40073P), Tangerine (40074R)
- Glass Mosaic Chunks – Marigold Opal (order no. 40003C), Cobalt Blue (order no. 40004D), Cornflower Blue Opal (order no. 40005E), Grenadine Red (order no. 40007G), Apple Jade Opal (order no. 40006F), Assorted Colors (order no. 40032L).
- Stringers and Noodles – assorted colors
- Modeling Clay

1. Before you start, cut out  $\frac{1}{5}$  of the moist clay in the kit and put it aside to seal the casting frame with. Hand sculpt or model a low relief image of your choice using the modeling tools included, or any other tools that you may have. Do not make it more than  $1\frac{1}{2}$ " thick. Make your relief about one inch thick at the thinnest part of your artwork and no more than  $1\frac{1}{2}$ " at the thickest. You can finish the surface any way you like. Keep in mind that the finished glass surface will be exactly like your clay surface. You can work freely on your model—slight undercuts will not cause problems.



The glass in the kit is sufficient for a model using only  $\frac{4}{5}$  of the clay you have in the kit—the extra clay is provided to seal the casting frame. To calculate how much Glass you need for a certain weight of clay, multiply the weight of the clay by 1.16 to get the weight of the glass. When your sculpture is complete you can smooth it out as shown in the photo below or leave it rough.



2. Once your sculpture is complete it's time to start preparing the mold for the glass casting. Choose a round or square cardboard box depending on your project. Remove the top and bottom. Place your art piece over a flat sheet of plastic, wood or glass. Seal the bottom edge of the box with clay on the inside and outside so the Casting Mix will not seep under it. Make sure the height of the mold is between  $1\frac{1}{2}$ " to 2" higher than the top of your art piece.



3. You are now ready to pour the 'investment' or casting mix. **Warning:** Casting Mix contains Silica. Overexposure to silica may cause cancer, so make sure to wear a NIOSH mask approved for dust and mist while working with the casting mix. Read the label for further details.

Pour 4 pints of water into a 2 gallon bucket. With your mask properly fitted to your face, use a scoop and slowly sprinkle the Casting Mix into the water. Mix slowly, without trapping too much air and making sure all the dry material is well dispersed.

4. Pour Casting Mix into the mold. Avoid pouring directly over your artwork—pour on the side to avoid trapping air in the piece.



5. Once you have all the material in the mold, tap the mold on the side to help release any air that has been trapped in the Casting Mix.



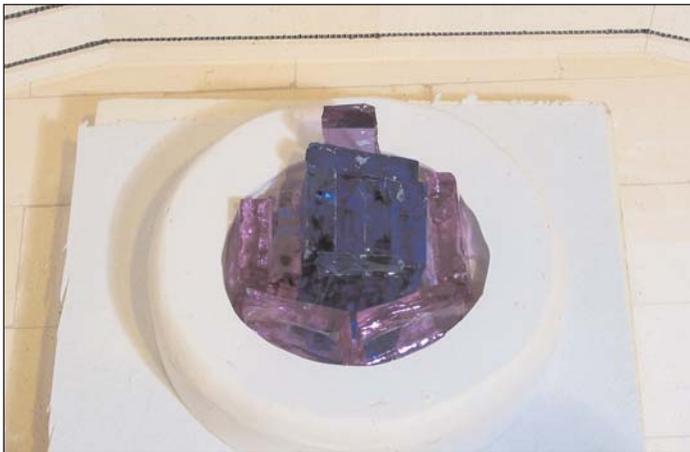
6. Let it set until completely cold, preferably overnight, then pull out the original clay model. Do not expect to save the original—you may have to dig it out, especially if there are undercuts. Be careful not to chip the mold in the process. Clean the mold and smooth out the edges with a damp sponge. Allow it to dry at room temperature.



7. Once the mold is completely dry, you are ready to cast the glass. The mold is ready for use as is, however if you spray it first with dry Graphite-Film Lubricant (available at auto parts stores), it will separate easier from the glass. Place a plastic bag in the mold cavity and fill it with water to the top edge or the thickness you have planned for the art piece. Weigh the water in the bag and multiply by 2.5—this will be the weight of the glass needed to fill the mold to the desired thickness.

8. Place a refractory shelf in the kiln on top of 1" posts to raise it off the kiln floor. This improves heat circulation in the kiln. Place a 1/2" layer of sand on the shelf and position your mold on the sand. Use a level to make sure the mold is level in all directions, adjusting by pushing it into the sand as needed.

9. Wash the glass billets thoroughly with dish soap and water—rinse and dry. Wash them again with window cleaner and dry thoroughly. Stack the clean glass on edge in the mold cavity with taller pieces towards the center and shorter ones towards the outside. Avoid having pieces touching the wall of the mold and be careful not to chip the mold. If you want to add color to your piece, place Glass Mosaic Chunks or Casting Glass Tiles in the mold, either under or in between the clear billets. You may also introduce glass stringers or noodles into your casting. These items are available from AMACO®.



10. If you are using an Excel® GSF-670 kiln or if you have an electronic control on your kiln, use your kiln's specific directions to program the following firing schedule:

- a. Set the rise in temperature at 250°F per hour until it reaches 1250°F. Hold the temperature for 1/2 hour.
- b. Keep the temperature at 250°F per hour until it reaches 1450°F and hold for 2 hours.
- c. Crash cool to 950°F and hold for 6 hour for annealing.
- d. Start cooling at 30°F an hour until it reaches 750°F.
- e. Start cooling at 60°F an hour until it reaches 500°F.
- f. Start cooling at 100°F an hour until it reaches 200°F then let the kiln cool to room temperature on its own.

If your kiln is not equipped with an electronic control, use a pyrometer and follow the above schedule manually.

**Do not open the kiln until it reaches room temperature. Do not remove the mold until it, too, has cooled to room temperature.**

11. Once the kiln is at room temperature, open it and check the temperature of the glass—it will retain heat longer than the kiln chamber. When the glass is at room temperature, remove the mold and place it in a container of water. As the mold soaks in the water, you will be able to break it away from the glass. The mold will be destroyed in the process. This is a “waste mold” for one time use only. **Caution:** Be extremely careful removing the mold—the glass may have sharp edges. Use a stiff brush to remove any mold pieces stuck in crevices.

12. Wearing your mask and safety glasses, grind smooth any sharp edges using a hand held grinding stone. Wash your glass art piece thoroughly to remove any particles from the mold or grinding.



Call or email us to receive your FREE copy of Lesson Plan No. 18: *A Warm Glass Renaissance, Modern Technology Revives an Ancient Glass Form* (Reorder No. 11694N).



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