

Simple Pate de Verre

(art + science; art + history)

Translated to “glass paste,” the French term *Pate de Verre* refers to a glass vessel kiln-fired in a mold. Evidence of this technique dates back to ancient Egyptians, although French artists embraced the technique more than a century ago, thus bringing its name into existence. Pieces include jewelry ornamentation, decorative vessels, and elements in sculptural form. Henri Cros, Amalric Walter, and Marcel Corrette were prolific artists working in cast glass.

There are many different methods of execution for *Pate de Verre*. The focus of this project will be a one-part mold that is filled with frit (bits of glass) and fired to a full fuse, uniting the glass into an integral piece to form a paperweight.

Grade Levels 5-12

Note: instructions and materials based on a class of 25 students. Adjust as needed.

Preparation

1. Hand-build the clay model into a basic shape, approximately 1" x 3" (round, oval, square or other shape). Enhance the piece by sculpting with modeling tools.
2. Place finished model face up in the middle of a plastic container, allowing at least 1" clearance around the model. Rub some water on the bottom of the clay model to help it stick to the floor of the container.



Materials

Amaco® COE 90 Casting Glass Billet Chunks, Clear, 1-1/2-lb jar (33593-1001), one jar will make 5-7, 1" deep x 3" wide paper weights

Amaco® COE 90 Color Glass 6" x 6" square (34104-5166) or 7" dia round (34100-5127), choose assorted colors

Amaco COE 90 Frit, 3-oz jars (34959-4043), choose assorted colors

Note: clear billet chunks will be used as the bulk of the casting glass, colored glass sheets broken into billet chunks and frit for fine detail colorant.

Blick® Premium-Grade Canvas (07309-1062), one yard

Amaco® Excel Glass Kiln (30179-1001)

Amaco® Kiln Wash (32922-0001)

Amaco® Glass Casting Mix, fine (33595-1001) one 10-lb package will make approximately five molds

Blick® White Talc Clay (30534-1025) OR Blick® Modeling Clay (33211-1106), need 1/4-lb clay per model

Elmer's® Glue-All 7-5/8-oz (23810-1005)

Safety Goggles (61705-1001)

Blick® Safety Gloves, package of two pairs (62952-1001),

Blick® Scholastic Golden Taklon Brush, (05858-1001), one per student

Student Modeling Tools (30361-1009), share four 7-piece sets across class

Round 10-Well Tray (03041-1010), share between two students

Optional Materials

Amaco® Diamond Pad (33596-1038), for polishing rough edges

Amaco® Diamond-Tipped Glass Engraver (35113-1001), for polishing rough detail



Preparation, continued

3. Mix 2-lb molding powder with water, according to package directions. Brush on a light coat of mold mix to completely cover the model, making sure to coat fine details. Once a full coat is applied to top and sides, slowly pour into the container until the mold mix is 1" above the top of the model.
4. Allow mold to set up overnight before removing clay model. Scoop out clay model with modeling tools. Set the mold aside in an area with low humidity and let air-dry for one week.*
5. Use prepared frit (small pieces of glass) or make your own frit from chunks, scraps or sheets of glass. NOTE: Glass must be COE 90 to be compatible. Or, use prepared frit

To make frit from sheet glass or glass scraps, put on safety glasses and gloves, place glass on canvas and fold it securely. Place inside a plastic bag for extra safety. Hammer into desirable frit size. Set aside.

NOTE: This process could produce extremely fine pieces of glass that may become airborne, recommend wearing a [Fiberglass Respirator](#) (34939-1002).

Process

1. Sprinkle various frit colors in wells of tray. Squeeze small drops of Blick White Glue into frit. Mix with small-ended modeling tool to make into a paste.
2. Brush paste inside of the mold to areas of interest. Repeat until details are filled in.

3. Fill remainder of mold cavity with billet chunks. Place 1/2" glass above the surface of the mold for every 1" depth inside the mold. Make sure peak of mound is centered.**
4. Coat kiln shelf with kiln wash and let dry. Arrange mold in kiln, allowing 1" space around mold and at least 4" above for air flow.
5. Fire according to schedule below. Allow one full day for firing, approximately 8-1/2 hours.
6. On second day, carefully open kiln door, remove mold from kiln. If mold is still warm, allow an additional day for cooling.
7. Place cooled mold in a bucket of water until all air bubbles rise to the surface. Remove mold from bucket. Casting may pop out of mold. If so, the mold may be dried out and reused. If not, mold will need to be broken to remove casting.
8. Clean glass paperweight with water and a toothbrush. Although most edges will be rounded, sand down any rough edges with the diamond pad.
Use diamond-tipped engraver if any details requires smoothing.

*To expedite the drying time of the mold, place mold in kiln. Program glass kiln to ramp for 1 hour to 200°F and hold for 1 hour. Ramp to 600°F over a 6 hour period, holding for 6 hours, let cool before removing.

**Glass quantity may vary due to the shape of mold.

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5-segment firing schedule:

- 1) Set programmer on kiln to ramp up 400°F per hour to 1000°F. Hold for 15 minutes.
- 2) Ramp up 100°F per hour to 1200°F. No hold (0 minutes).
- 3) Ramp up 600°F per hour to 1635°F. Hold for 15 minutes.

Annealing process:

- 4) Ramp down 9999° per hour to 950°. This defaults the programmer to crash the temperature. Hold for 30 minutes.
- 5) Ramp down 150°F per hour to 750°F. No hold.

This completes the firing schedule.

National Standards

Content Standard #1— Understanding and applying media, techniques, and processes

5-8 Students intentionally take advantage of the qualities and characteristics of art media, techniques, and processes to enhance communication of their experiences and ideas

9-12 Students conceive and create works of visual art that demonstrate an understanding of how the communication of their ideas relates to the media, techniques, and processes they use

Content Standard #4 — Understanding the visual arts in relation to history and cultures

5-8 Students analyze, describe, and demonstrate how factors of time and place (such as climate, resources, ideas, and technology) influence visual characteristics that give meaning and value to a work of art

9-12 Students describe the function and explore the meaning of specific art objects within varied cultures, times, and places

Content Standard #6 — Making connections between visual arts and other disciplines

5-8 Students describe ways in which the principles and subject matter of other disciplines taught in the school are interrelated with the visual arts

9-12 Students compare characteristics of visual arts within a particular historical period or style with ideas, issues, or themes in the humanities or sciences

Glass Fun Facts! Did you know...

- The basic recipe to make glass is a combination of soda ash (NaCO_3), lime (CaCO_3), and silica (SiO_2); a coarse sand.
- It is said glass is actually in a liquid state. Ever notice on an aged window pane the glass is thicker toward the bottom than the top? Or glass dimpling over time? There is much debate surrounding this issue, as some will say glass is a solid, but many claim glass is a “supercooled liquid.”
 - There are three basic types of glass; Cold Glass, Warm Glass, and Hot Glass. Cold Glass refers to glass that is not heated, such as stained glass. Warm Glass refers to glass heated in a kiln, such as Pate de Verre. Hot Glass refers to work done in a crucible for blown glass.