

Press Molds Overview

Written in Stone / Spring 2010

Materials: Clay

Clay is *plastic* earth; that is, it is both *elastic* (stretchy) and *cohesive* (sticks to itself). These characteristics result from the plate-like particles that make up clay. The basic clay particle is a silicate of alumina ($\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$). These platelets stick to one another the way two sheets of glass would. They are formed by erosion of silica-bearing or *feldspathic* rock formations.

Residual or Primary clays are found close to the rock they eroded from and have relatively coarse particles. Kaolin is a primary clay.

Sedimentary or Secondary clays have been moved by wind or water, become refined in particle size, and picking up organic material that affect plasticity, and minerals that affect color and firing characteristics.

Clays are mixed with one another to form clay bodies with different characteristics. Clay bodies can be *fired*, or baked, in a kiln and become hard and waterproof. Earthenware bodies remain porous. Stoneware bodies *vitrify* (become glassy) and will hold water.

The plasticity of clay makes it an ideal sculptural material – easy to form and able to capture and hold very subtle impressions. Aggregates [sand (silica) or *grog* (ground fired clay)] are sometimes added to make a more “open” clay body, with a more interesting texture.

Materials: Plaster

Common plaster is a powdered form of the mineral Gypsum. When water is added to this powder, it becomes a liquid that rapidly sets (becomes solid), taking the form of whatever contains it.

Natural gypsum is composed of crystallized salts of calcium, mainly calcium sulfate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), mixed with silicates and carbonates. The material is pulverized and baked in a kiln at about 350°F until 3/4ths of the water is driven off, converting the gypsum to a fine white powder known as Plaster of Paris ($2\text{CaSO}_4 \cdot \text{H}_2\text{O}$). This process is called *calcining*. When the lost water is added back to the plaster, it sets up to a solid mass in about 20 minutes, giving off heat equal to that necessary to calcine it. The process of giving off heat is called the *exotherm*.

Dry plaster, in solid or powder form, is *hygroscopic* (water-searching). It is always looking for its missing water, from the air, from wet clay, from a damp surface, or from your skin. This is one of the most important things to be aware of when working with plaster!

Process: Mixing Plaster

The Floating Island Method

For large amounts of plaster it's best to rely on a formula (usually about 7 parts plaster to 10 parts water by weight). For small batches use this method.

- Fill a flexible plastic container (one quart or less) about 2/3 full with cool water (warm water accelerates the set).
- Slowly sift handfuls of plaster through your fingers over the surface of the water, allowing the plaster to be absorbed. Don't stir! Stirring accelerates the set.
- Keep going until an island of dry plaster appears in the center of the water. Sift in another handful or two.
- If your mold is ready, *now* you can stir, being careful to stir up from the bottom to minimize air bubbles. Tap the container to cause bubble to rise to the top where you can pull them to the side.
- When the plaster has the consistency of heavy half-and-half, you can pour it into your mold, which must be wet! Pour into the deepest spots first. Use the force of the flow to fill indentations and help prevent air bubbles from clinging there. Tap the ware board your mold is on to release bubbles.
- When the plaster surface loses its watery sheen and looks grainy, it has set, but it won't be really durable for at least an hour. Wait at least that long to remove clay if you are concerned about preserving fine details and not breaking your casting!

Project Translating

Press Molds (due Tuesday 4/13, Week 3)

Using the process demonstrated in studio, make at least three plaster relief casts of stones from clay press molds. Each cast should be at least 6" x 6." Look for stones with interesting shapes, textures, and contrasts..

Things to think about: translation of positive form to negative form and back again; translation of form from one material into another; light and shadow as revealers of form; the nature of relief sculpture; patterns; craft; finish.

Sources:

Andrews, Oliver. **Living Materials: A Sculptor's Handbook**. Berkeley: University of California Press, 1983.