



# Mold Material Comparison

## Build or Buy?

Why buy molds when you can build your own? Making your own molds instead of buying them is one of the best examples of a DIM (Did It Myself) attitude. It's not difficult to create your own molds for casting or slumping glass. A lot less difficult than you might think it is. You can make a mold from any found object or from anything you carve or sculpt. You can shape putty or modeling clay into an interesting shape and make a copy of it. You can steal something from your kitchen or buy something at a thrift shop or dollar store and make a copy of it. There are many ways to make molds with choices depending most on how many times you want to use the mold. For a few pennies you can quickly make a one-time use mold to try out an idea or you can take a little longer and make the same kind of molds that are sold commercially for multiple use.

## Pottery Plaster

Pottery Plaster is a great low-cost material that works well to make either negative or positive copies of whatever you want to copy to make a mold. Because it quickly wicks moisture away from slip cast ceramic clay, it is the most commonly used material for making mother molds to pour clay into or cast copies from.

## Mixing pottery plaster

- Carefully measure ratio of powder and water.
- Slowly sift the powder into the water and let settle until all the powder has soaked into the water.
- Stir slowly to avoid creating bubbles.
- Tamp or vibrate to ensure a smooth finish.
- Sets firm in about 30 minutes but takes 24 hours or more to fully dry.

Plaster can be fired in the kiln but some of it will stick to the glass so it is not suitable to use for casting or fusing molds.

## Plaster/Silica

A mixture of 50% pottery plaster and 50% silica flour (also called flint) makes an exceptional and low-cost material for casting and fusing molds. It's very low cost, easy to use and picks up fine detail.

## Mixing plaster/silica compound

- Mix even parts plaster and silica. Either stir or shake the mix well to ensure the compound is evenly mixed.
- When working with silica, either take care to avoid inhaling any dust or wear a mask. A simple disposable drywall mask is enough.
- Add powder to the water. If you do the reverse and add water to the powder you are likely to create lumps in the mix that you can't stir out.



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- The compound can be mixed in a variety of thicknesses anywhere from thin like cream to as thick as peanut butter. The thicker the mix the quicker it sets but a more liquid mix is more likely to leave a smoother surface.
- Sets firm in about 30 minutes but takes 24 hours or more to fully dry.

Molds made from plaster/silica can be fired in a kiln. They are intended for only one use but if handled carefully can be reused several times. Glass will not stick to this material so molds made from it do not need kiln wash.

## Alginate

Alginate is expensive but is excellent for mold making. It sets hard in only a few minutes, produces exceptional detail and does not contain silica so has no safety concerns.

### Mixing alginate

- Requires careful mixing ratios. Mix by weight 4 parts water to 1 part powder or by volume 2 parts powder to 3 parts water.
- Sift the powder into the water slowly. Stir gently to fully wet the powder than stir quickly to fully mix.
- Mix to a thick paste like peanut butter.
- Take care to avoid creating bubbles when mixing.
- Warmer water will speed up set time.

## Latex

This is my personal favourite material for making master molds to cast plaster or plaster/silica and to make molds for freeze and fuse castings. It's inexpensive, readily available and produces finely detailed fully flexible molds that can be reused hundreds of times.

### Making latex molds

- Attach the item to be copied to a board or piece of glass.
- Either glue it down or stick it on with a layer of modeling clay trimmed to match the object being copied. Modeling clay is a good way to elevate the object to allow you to make a deeper mold.
- Paint on a layer of latex and let set. Wet latex looks creamy like milk but when it dries it turns to transparent amber.
- Paint on another layer of latex and apply a layer or several layers of cheese cloth or surgical gauze. This it to stiffen the mold. Take care to fully saturate the gauze with latex and leave to dry.
- Apply more coats of latex to produce the desired thickness. Depending on the size of your mold, it could be just 2 or 3 coats or it could be 8 or 10 coats.

Latex molds can be used repeatedly. The material is soft and flexible enough it can even be used to make molds with undercuts.



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## Silicon

Silicon is a popular way to make mother molds to make copies from. There is a variety of different silicon compounds sold for mold making. It's a lot more expensive than latex but makes excellent molds and takes much less time to finish the mold making process.

### Making silicon molds

- Each of the two compounds must be thoroughly stirred before using.
- Mix equal parts of the two different compounds together and stir for at least 3 minutes.
- Pour out the mixture and let set. Different compounds take different times to set varying from a few minutes to a few hours.
- Silicon molds cannot be used in a kiln but can be used to make plaster or plaster/silica copies or to make molds for glass freeze and fuse castings.

## Ceramic Clay

Hand formed or sculpted clay can be used to make molds for casting or fusing but if some parts of the mold are thicker than other parts they will require slower ramp speeds to allow even heat distribution through the mold. If part of your mold is thinner, it will absorb or shed heat faster than any thicker parts. A different temperature at a different part of a mold can cause any glass in the mold to crack from thermal shock.

## Making clay molds

- You can hand form the clay or press it into something to copy the shape.
- Allow the clay to completely dry. How long depends on how thick the clay.
- Fire the clay mold in your kiln to create ceramic bisque. Each different kind of clay requires a different temperature for this. Earthenware clay requires the lowest temperature and porcelain clay the highest temperature.

Ceramic clay molds can be used repeatedly and require kiln wash to prevent glass from sticking to the clay.

## Slipcast Ceramic Clay

Almost all molds sold commercially to use for casting or fusing glass are made from slip cast ceramic clay poured into plaster molds. You can buy ceramic slip dry to be mixed with water or premixed liquid ready to use. Premixed slip includes different chemical deflocculants to hold the clay in suspension in the water so it doesn't separate and settle to the bottom of the container.

### Making slipcast molds

- Mix the ceramic slip to ensure there are no lumps.
- Pour the liquid clay into the plaster mold.
- Leave long enough for the moisture in the slip to wick into the plaster. When about 3 or 4 mm of the edge of the pour has partially dried enough to become firm, pick up the mold and



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pour out any of the as yet unset slip back into the container it came from.

- Leave the poured casting until the clay edge has set to about the consistency of cheese.
- How long will depend on how big the mold and how dry the air around the mold. Allow to dry naturally. Avoid applying heat or a fan to speed up drying. Doing that encourages the clay to crack.
- When the ceramic casting has set firm, remove it from the plaster mold. Using a blast of air from a compressor around the rim of the casting will make it easier to remove.
- Turn the plaster mold over and give it a light tap to release the ceramic casting. This clay casting is called "greenware".
- Leave the ceramic greenware mold to fully dry. Depending on how warm and how dry the room is, it could be a few days or more than a week to fully dry.
- When the mold is fully dry it can easily be sanded to smooth off as needed.
- Fire the sanded mold in your kiln to 1850F (1010C). That's Cone 06 for potters.

## Hydrocal

Hydrocal is mostly Plaster of Paris with a small amount of Portland cement added. Molds made from it have an exceptionally smooth surface which makes it popular for making mother molds to make copies from or to make finished castings to be painted. It can be fired in a kiln but glass will stick to it.

## "Hydrogel" Mold Compound

"Hydrogel" is a trade name for a popular alginate based compound for making molds. It's used the same way as Alginate and fully cures in 5 minutes. Because it is mostly water and sets fast, it's an excellent material for making face or body castings.

## Chalk (Calcium Carbonate)

Powdered chalk mixes easily the same as Plaster/Silica or Hydrocal but takes a very long time to set. It can be fired in the kiln but castings made from chalk will usually stick to glass.

## Lost Wax Molds

Molds made for lost wax castings are intended to be used only once so the most popular choice is Plaster/Silica. The molten material is dripped or poured into the mold then when it has set firm, the mold is destroyed.