



Castables Product Instructions and Tips for Use

The process of making shapes from molds is called casting. With a few basic supplies, instructions and tips you'll be casting successfully every time.

Casting Process:

Very simply, the casting process creates a clay shape from a mold. Slip (liquid clay) is poured into the plaster mold. When the casting's thickness is between $\frac{1}{8}$ and $\frac{1}{4}$ of an inch thick (total time in mold – 15-18 minutes), you can separate the two halves of the mold to remove the greenware (unfired clay shape). Once the greenware has dried sufficiently (approximately 45 minutes) – when you can handle the ware firmly without deforming the shape – you will clean up seam lines and unwanted marks with cleaning tools.

At the greenware stage you'll have a number of options for decorating, designing, or firing. Physical texture and surfaces modifications can be made with carving and cutting tools; true underglazes and/or translucent underglazes developed specifically for use on greenware can be applied (Stroke & Coat does also perform well on greenware – see glazing tips below), or the greenware shape can be fired to shelf cone 04 (1940° F), becoming ceramic bisque (fired greenware).

Molds:

Tips for using, storing and caring for molds:

- While Castables molds are sturdy, they can chip or break if dropped. Handle with care.
- Mold designs will have varying levels of detail, from very plain to very ornate. The casting process is an abrasive process; over time each pour will erode away some of the mold's detail and eventually a mold will wear out. As a general rule the more detail a mold has, the sooner it will wear out. Note: with the Castables, we expect that you can get over 100 pours with good care of the mold.
- Molds are porous and will absorb water. During casting you'll notice that the mold will become damp after consecutive pours. As the mold becomes wetter from each casting, the time it takes to produce another casting will increase. When a mold feels cold and clammy it is too wet and it should dry before using again. Casting from a wet mold produces poor quality greenware, ruins detail areas and shortens the life of a mold.

- To dry a wet mold, band the two halves together and let dry. While it may be tempting to let the mold dry open this method can cause warping; the slightest amount of warping may cause the two halves to improperly fit together and allow slip to leak from the mold.
- When you are finished casting, carefully clean the mold inside and out. Small clay particles which form in the casting cavity can be removed with a dusting brush or by pressing a small ball of clay against them. Extreme caution should be exercised when using a tool of any kind to clean the interior of a mold. The excess clay may be scraped off the exterior of the mold with a fettling knife or plastic scraper. Small particles of clay may be removed with a clean dry sponge or a soft cloth.
- Dust and debris can create imperfections in your castings. First Usage: when opening the mold for the first time, you will notice a powder-like substance. This powder is used to help prevent the mold sections from sticking together, and should be dusted from the mold with a large duster brush (any soft-bristled brush will do – avoid a stiff bristled brush as it could scratch and mar the detail inside of the mold. Reserve any brush used for mold cleaning purposes for that use only – do not use for glazing or painting). Subsequent Usage: open molds and make sure internal cavity is free from dust, dirt or other contaminants. Use a damp sponge to lightly wash internal cavity. Put mold halves together and secure with rubber band. Make sure seams fit snugly together and the rubber band tightly keeps halves together.
- Storage: keep in a dry, well ventilated place to prevent mildew. Always store molds facing down (to prevent debris from accidentally falling inside the mold), with both halves banded together (to prevent warping and/or damage to detail).

Slip:

Mayco provides ready-to-use slip in 16 oz. squeeze bottles.

- Before each use shake slip bottle vigorously for 10 to 15 seconds. Slip should have a creamy, homogenous look and feel.
- Dried particles and lumps can occasionally make their way into the bottle. If you notice debris you can first strain the slip prior to pouring into the mold.
- A pint of slip can yield 10 to 12 castings – make sure you salvage unused slip after every pour.

Pouring Tips:

Using Mayco's flip-top bottle:

- Holding the mold at a slight angle slowly and steadily squeeze slip into mold opening (called a pour gate). As the mold fills turn it to straight vertical position and fill mold until slip reaches the top of the pour gate.
- Avoid squirting the slip with too much force as this may cause surface issues to develop in your bisque.
- Water will be absorbed into the mold as the shape forms. Check slip level after 3-4 minutes and add slip to top of pour hole if settling does occur.

Draining & Drying:

The greenware will take approximately 5-8 minutes to form the proper thickness (depending on weather conditions as high humidity will slow process); the casting should have a thickness of 1/4 to 1/2 of an inch thick.

- You can check the thickness by cutting into the clay that has settled in the pour gate (this material is called “spare” and will be trimmed away as part of the cleaning process).
- Once the greenware has set up or formed empty the excess slip out of the mold.
- Tilt the mold at a 45° angle and slowly empty slip from the pour gate into a measuring cup (or any container that features a pour spout). For two pour gate molds: alternate from one pour gate to the other by gently rocking the mold while it drains. This rocking motion will prevent slip from building up in one side of the mold and ensure an even thickness to the casting as it dries.
- Avoid letting the slip “slurp” or “gurgle” as it exits. Emptying the slip too quickly (slurps or gurgles) may cause the casting’s sides to collapse.
- If slip clogs as it drains, poke a hole with a pencil or straw to allow air into mold cavity and resume draining process.
- Once you have salvaged as much slip as you can, place the emptied mold on glaze drying rack with the pour gate facing down, which will allow any remaining drips to drain from the mold. Place newspaper beneath the rack – makes clean up very easy.
- Humidity and other weather conditions can affect drying time.
- Do not allow the casting to become completely solid.

Salvaging Slip:

- Use a funnel to pour unused slip back into the flip-top bottle. Tighten cap and shake for 10-15 seconds to remix slip.

Removing the Casting:

Perhaps the trickiest part of the casting process – if you proceed gently and slowly you will have few problems.

- It will take approximately 15-18 minutes for a Castable shape to become solid enough to remove from the mold. If you have any doubts that the shape is ready allow for an additional 10 minutes of drying time.
- The spare material must first be removed from the pour hole with a fettling knife (a non-sharpened blade that resembles a butter knife or spatula). Carefully slide the knife beneath the spare and slowly carve off the excess material.
- Remove the rubber band or banding strap. Lay the mold on a flat surface where you can easily pull the top half straight up and away from the bottom half.
- When removing the top half avoid dragging or scraping it against the casting as this could cause unwanted marks or damage (minor defects can be cleaned up and corrected during the cleaning process).

- Having successfully removed the top half place it on a flat surface with the internal cavity facing up to avoid damage to the interior detail.
- Place the bottom half of the mold containing the shape in one hand and turn it slowly towards your bare hand (extend your fingers and flatten your palm to create a flat landing area). As you flip the mold over, the greenware should release from the mold and fall easily into your bare hand.
- Never grab or pull the casting from the mold as this action will most likely tear or distort the casting shape.
- If the casting does not immediately drop, use your fingers to tap the back of the mold 3-4 times (never tap the mold against any surface to jar the shape loose). If the shape does not release it is most likely too wet. Do not force a wet casting out of the mold as it may deform as it continues to dry. Lay mold open, flat on the back half and continue to let the shape dry (do not leave casting in the mold too long as it may crack).
- Once removed, place the greenware on a flat surface covered with newspaper. Allow to dry at room temperature until “leather-hard” and most of the moisture has evaporated from the shape.

Cleaning Greenware:

“Cleaning“ is the process by which mold seam lines, marks, small imperfections, are smoothed out.

- Cleaning greenware can create dust. Wear a nuisance mask to avoid breathing the clay dust. Choose a well-ventilated work area that can be cleaned easily with water. You may want to choose a room in which glazing is not done as clay dust can contaminate unfired glazed surfaces. You may also want to cover your table top or counter with several layers of newspaper or other disposable protective coverings.
- Make sure your hands are free from oils, lotions or other contaminants. It is also a good idea not to have food or drinks around the work area.
- Handle the greenware with both hands and carefully cradle it in one hand as you clean it with the other hand.
- Begin cleaning by removing the seam lines (which will be present around the shape where the two mold halves met). The Cleaning Tool (provided in the Mayco Greenware Cleaning Kit) features two blades: a straight spear-shaped blade and a curved crescent-shaped blade.
- Holding the edge of the spear-blade end of the cleaning tool at a 45° angle to the seam line gently scrape downward against the seam line.
- When you have removed most of the seam line use the scouring pad (provided) to smooth over the last remnants of the seam. Apply a light circular motion along the seam line – not too wide of an area and not too much pressure.
- Use soft brush to remove dust and dried clay particles.
- The final cleaning step is to use a damp sponge to wipe down the greenware and remove abrasion marks, scratches and imperfections created during casting and cleaning processes. Too wet a sponge can dissolve some of the shape’s detail; too dry and you may inadvertently polish the surface (see over cleaning below).

Cautions:

- Do not blow the dust off the piece. It is not only unhealthy but may contaminate open jars of color or settle on glazed surfaces.
- While other scouring materials can be substituted for the scouring pad never use sandpaper. Abrasive material will become embedded in the greenware and cause defects in your glaze firing.
- Always use a dedicated (for cleaning purposes only) soft brush to remove dusting during cleaning. Do not use a cloth as you may accidentally polish the greenware (see over cleaning below).
- Over cleaning will create too smooth a surface on the greenware. Clay contains microscopic platelets; an ideal clay surface would look like a deck of cards fanned out (on bisque you will notice a rough feel on the surface). A rough surface is what glaze needs to grab onto when fired. Too smooth a surface and glazes will crawl – glaze cannot grab onto the bisque surface so it rolls up onto itself. Do not become over zealous when cleaning greenware.
- “Hard Spots” are areas that repel water and glaze. There are a number of reasons for hard spots; one of the most common has to do with the manner in which slip is poured into a mold (thus the recommendations for slow and steady pouring of slip). If while cleaning greenware you notice such an area you can prepare a mixture of acetic acid (white vinegar) and water at a ratio of 1-2 tablespoons of vinegar to 8 oz. of water. Apply this solution very lightly to the problem area with a damp sponge, working from the center of the spot out to the edge of the spot. This solution works to open the pores in the overly dense hard spot. (note: too much vinegar will cause the greenware surface to fizz much like an Alka-Seltzer tablet).

Greenware Design Options:

Cutting/Carving:

Greenware provides you the opportunity to carve, etch and cut into the body to create special effects (a face in the pumpkin shape) or a functional item (create a star nightlight).

- Greenware should be moist to ensure best design work. After removing the casting from the mold you should be able to begin cutting with 15-20 minutes or when the casting is firm enough to handle without damaging its shape.
- Use an Exacto knife for cut outs.
- Clean cut outs as you would seams (as noted above). Make sure sharp edges are properly smoothed as glaze will not adhere to a sharp edge.

Coloring/Glazing

Decorating colors designed specifically for use on greenware are traditional underglazes and translucent underglazes. Translucent underglazes are highly pigmented colors primarily used to detailed brushstrokes; traditional underglazes are available in literally hundreds of colors. Greenware colors will fire to a matte finish;

a clear glaze application and second firing will be required to obtain a gloss finish. Whether you add color at the greenware stage or at the bisque stage is entirely your preference.

In select situations Mayco's Stroke & Coat glazes can be used on greenware and will fire to a gloss finish, offering a single process for firing greenware and glazing. Pieces that can be dry footed or have areas left unglazed (such as the bottom of a tile) work best as gases and moisture from the greenware need a direct escape path (if gases force their way through the glaze they can dull the Stroke & Coat finish).

Firing Greenware:

Firing greenware converts the shape into bisque. As heat is applied to the greenware the clay body materials sinter, or fuse together. Additional heat processing forms a glassy phase in earthenware, which fills in some, but not all, of the pores in the sintered bisque. Earthenware remains porous when properly bisque fired to shelf cone 04 1945°F (1063°C).

- Greenware should be bone dry before firing. Excess moisture in the ware turns to steam during the firing process and can cause the ware to crack or burst. You can check for dryness by touching the ware to your wrist: ware will feel cold if not totally dry.

Loading the Kiln

- Greenware should not be placed on the floor of the kiln. The first shelf should be 1" off the floor.
- Coat kiln shelves with kiln wash.
- Place greenware directly on the kiln shelf in an upright position (if using traditional underglazes you will not need to stilt the ware).
- Do not place ware too close to the thermocouple or peep holes.
- Low fire greenware can touch each other without sticking, but it is a better practice to not overload the kiln.
- Place a Self-Supporting Cone (or large cone in a cone plaque) on each shelf.

Firing the Kiln

- Set kiln to fire to cone 04 1945°F (1063°C) at the slow (preferred – for best results) setting or ramp rate.
- An option for programmable kilns is to add a hold segment at the beginning of the firing cycle to help evaporate any water that may be in the ware. Set the initial ramp to 200° F (below water's boiling point) for 5-10 minutes.
- Close the kiln lid, turn on vent and begin the firing.
- Firing will take approximately 7 – 8 hours depending on the load.
- Allow the kiln to cool to a minimum temperature of 150° F before opening lid.
- Kiln should be vented to ensure that all the moisture and organic materials can be eliminated from the kiln and kiln room.