Production Molds

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Unit 9

Project Requirements

Create a set of three to five articles produced using either a purchased slipcasting plaster mold or a slipcasting mold you made yourself. The articles must use the same mold to show consistency in production, but articles can be finished using different techniques. In your record book story, share a business plan for selling items made using production molds.

Basic Information

Ceramic molds are a fun and easy way to create beautiful and unique pottery pieces. Unlike throwing on a wheel, using molds allows you to make consistent shapes and designs without needing advanced wheel throwing skills. This unit will teach you the basics of ceramic molds and guide you through the process of creating your first piece!

Ceramic molds are pre-made forms that you can use to shape clay into specific designs. They are like templates that help you create pottery pieces with a consistent size and shape. Molds are often made of plaster, which absorbs water from the clay and helps it harden.

These molds are hollow and designed to hold liquid clay (called slip). The slip hardens as the plaster absorbs the water, forming the shape of the mold.

The Importance of Your Slip

Slip isn't just clay put into a lot of water. Clay particles float in water and when you quit stirring, they fall to the bottom. The secret to making slip is to use a deflocculant, a chemical agent used to reduce the clay particles' attraction in liquid suspensions. It helps to disperse solid particles evenly in a liquid, preventing settling. Using them avoids excessive water addition and makes the slip smoother and more consistent.

There are different types of deflocculants such as bentonite, sodium silicate, and synthetic deflocculants like the products Optapix and Dolapix. Darvan 7 is one deflocculant preferred with porcelains and high iron content clay, while Darvan 811 can be used for stoneware, high fire slips and red low fire slips. Darvan 7 doesn't erode or wear away plaster molds like sodium silicate will.

Prepare a small quantity of slip and gradually add the deflocculant. Use a spatula or mixing tool to lift the slip up. It should form a continuous ribbon without breaking. Mix until the suspension is free from lumps. Take notes on the quantity used, so you can recreate the same viscosity in future batches.

Alternatively, rather than mixing your own, you can purchase slip that already has the correct properties for use in slip mold production.

Why Use Ceramic Molds?

Using molds is a great way to learn pottery because:

- **It's Beginner-Friendly:**
  You don't need advanced skills to create beautiful pieces.
- **Consistency:**
  Molds help you create pieces that are uniform in size and shape.
- **Creative Potential:**
  You can still add your own artistic touches, like carving, painting, or glazing, to make each piece unique.
- **Reclaimable:**
  Your clay is recyclable, so if you mess it up, you can reclaim the clay and start over.

Ceramic molds are an excellent tool for beginner potters to explore their creativity and learn the basics of pottery. By following the techniques in this chapter, you can create your own tiles, functional or decorative pieces with ease. Remember, pottery is all about experimenting and having fun, so don't be afraid to try new designs and ideas. If you are looking for more advanced skills, you can try making your own mold, but it is easier to purchase a mold of a figurine for Project 1 and a mold for a functional item for Project 2. Happy slip casting!

What You'll Need

Here's what you'll need to get started with molds:

- **Ceramic Slip Casting Mold:**
  Choose a mold based on the piece you want to create (e.g., a bowl, plate, or figurine). Plaster molds are the best option.
- **Slip:**
  For slip casting molds, you'll need liquid clay (slip), which can be poured into the mold.
- **Sponge:**
  To clean and smooth your piece.
- **Pottery Tools:**
  - Needle tool (for details and trimming)
  - Wooden rib or scraper (for smoothing)
- **Bucket of Water:**
  For cleaning your tools and hands.
- **Release Agent:**
  If your mold isn't made of plaster, you may need a release agent (like cooking spray or cornstarch) to prevent the clay from sticking.
- **Towel:**
  For cleanup.

Image Source: https://www.thecrucible.org/slip-casting-in-five-steps/

Guide to Using Ceramic Molds

Using Slip Casting Molds

Slip casting molds are perfect for making hollow objects like vases, pitchers, or figurines. It is important to use molds made out of plaster as the plaster is porous and wicks (pulls) the moisture out of the slip using something called capillary action. The plaster mold acts like a paper towel pulling the moisture out. The longer the slip sits in the mold, the thicker the walls will get as it pulls the particles toward the edges of the mold. The open part of the mold where you pour the slip in is called the gate. The two sides of the mold sometimes have indentations and tabs that fit together, called keys, that line up the two sides and help hold the pieces together and keep them from shifting when they are joined. Lastly, each side of the mold is carved out to create the shape of the casting.

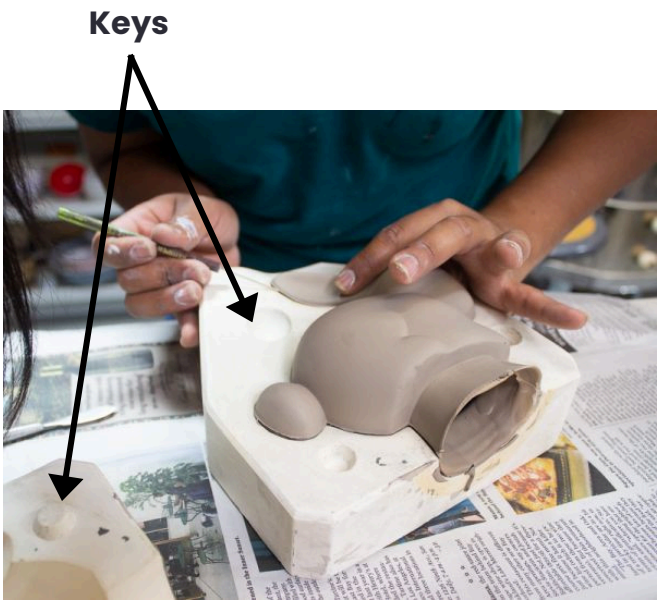

Image Source: https://www.thecrucible.org/slip-casting-in-five-steps/

Here's how to use slip casting molds:

Prepare the Mold:

- Make sure your plaster mold is clean and dry.
- Secure the mold halves together using rubber bands or clamps.

Pour the Slip:

- Stir your slip (liquid clay) to make it smooth. It might need to sit a little between stirring to make it more dense.
- Slowly pour the slip into the mold until it's full.

Wait for the Clay to Set:

- Let the slip sit in the mold for 30-45 minutes (depending on the size of the mold). The plaster will absorb water from the slip, forming a layer of solid clay against the mold's surface.

Pour Out Excess Slip:

- Carefully pour out any remaining liquid slip from the mold. This leaves a hollow form inside.

Dry the Piece:

- Leave the mold undisturbed for a few hours to let the clay harden enough for the shape to set up. Some of the moisture evaporates during this time.
- Once the clay is firm, gently separate the mold halves and remove the piece by a gentle jiggle motion so it releases from the mold.

Guide to Using Ceramic Molds

Trim and Smooth:

- Use a needle tool to trim any rough edges or seams.
- Smooth the surface with a damp sponge.

Tips for Success

Here are some tips to help you make the most of your ceramic molds:

- **Start with Simple Shapes:**
  Choose molds with basic designs, like bowls or cups, before trying more complex shapes.

- **Keep Clay Moist:**
  Dry clay can crack or stick to the mold, so make sure your clay is soft and pliable.

- **Be Patient:**
  Don't rush the process! Let the clay set in the mold for the recommended time before removing it.

- **Clean Your Mold:**
  Wash your mold after every use to keep it in good condition and prevent clay buildup.

- **Experiment with Decoration:**
  Once your piece is out of the mold, you can add texture, carving, or painting to make it unique.

Common Challenges and Solutions

Here are some issues beginners might face and how to fix them:

Clay Sticking to the Mold:

- Use a release agent if your mold isn't plaster.
- Make sure your slip isn't too wet.

Air Bubbles:

- Mix your slip to the right consistency.
- Tap the mold gently to release trapped air when using slip.

Uneven Edges:

- Use a needle tool to trim excess clay and smooth the edges with a sponge.

Cracks:

- Avoid letting your clay dry too quickly. Cover it with plastic wrap if needed.Usually, it takes a while to figure out how long to dry at room temperature. Heating doesn't make it dry faster.

Warping:

- Slipcast shapes can warp more easily than wheel thrown objects during firing.
- This may be due to the slip casting recipe that has been used. For example, if your slip has soda feldspar, which has a lower melting point than other types of feldspar, that may cause some warping.

Unit 9 - Production Molds Figurine Project 1

Materials Needed

- Plaster mold (made or purchased two-piece figurine mold)
- Slip (watery clay)
- Sponge
- Toothpicks or wood/plastic detailing tools
- Water cup
- Newspaper or work board

Basic Information

In ceramics, a mold is usually made of plaster and shaped like an object—such as an animal, person, or decorative figure. Slip is poured into the mold to copy the shape. After removing it from the mold, artists can add details and make each figurine unique.

In this project, you will be making a figurine out of a two-piece figurine mold. Be sure to handle molds gently as they are fragile. Never poke tools deeply into the mold. Be sure to clean your hands before and after working with the clay. Also, move slowly when opening molds to avoid breaking the clay.

Steps

Step 1: Prepare the Clay

- Stir your slip (liquid clay) to make it smooth and the right consistency. It should be thick but still thin enough to pour.

Step 2: Prepare the Mold

- Make sure the mold is clean and dry.

Step 3: Join Mold Sections

- Carefully press the mold pieces together. If there are keys, be sure they fit together. Bind the pieces together firmly with rubber bands.

Step 4: Pour the Clay Into the Mold

- Pour the slip slowly so it goes into every part of the mold and to avoid air bubbles.
- If needed, jiggle the mold to get the slip into details (ears, arms, faces).

Step 5: Pour Our Excess Slip

- Wait 30-45 minutes and pour out the excess slip to leave the middle hollow.
- Let the mold sit another hour or two to dry until leather-hard (firm but still damp).

Step 6: Remove the Figurine from the Mold

- Gently open the mold.
- Carefully lift out the figurine using both hands.

Step 7: Clean and Smooth

- Use fingers or a damp sponge to smooth seam lines.
- Fill cracks or gaps with small pieces of clay.
- Blend carefully so seams disappear.

Unit 9 - Production Molds Figurine Project 1

Steps Continued

Step 8: Add Details

- Carve facial features, textures, or patterns.
- Attach extra clay for accessories (hats, tails, wings).
- Use slip to attach added pieces securely.

Step 9: Drying

- Let the figurine dry slowly under plastic.
- Turn occasionally to prevent warping.
- When fully dry, it is ready for firing.

What Happens Next?

- Bisque Firing – The kiln fires the clay, making it hard.
- Glazing – Color is added with glaze.
- Glaze Firing – The final firing makes it shiny and strong.

Image Source: https://www.thecrucible.org/slip-casting-in-five-steps/

Unit 9 - Slip Casting Molds Functional Item Project 2

Basic Information

For this project, you will try slip casting into a mold to create a functional piece, like a cup, plate, bowl, pitcher, vase, ornament, piggy bank, or other useful item. Items with a handle are more difficult to manage and may be an option if you are repeating this unit or for Senior 4-H members.

Steps

Use the steps you have learned from your practice projects to create your exhibit pieces. You can use glazing techniques learned from the other glazing units in this manual to finish your pieces.

- Complete your e-record and expense supplement sheets.
- Evaluate your project using the Unit 9 guideline for judging.

Unit 9 - Production Molds Exhibit Piece

Basic Information

This project will be your exhibit piece for project judging. Create a set of three to five articles produced using either a purchased slipcasting plaster mold or a slipcasting mold you made yourself. The articles must use the same mold to show consistency in production, but articles can be finished using different techniques.

Steps

Use the steps you have learned from your practice projects to create your exhibit pieces. You can use glazing techniques learned from the other glazing units in this manual to finish your pieces.

- Complete your e-record and expense supplement sheets.
- Evaluate your project using the Unit 9 guideline for judging.

Guidelines for Judging Your Project

Judging ceramic pieces made with molds is about balancing technical precision with creative expression. A well-made piece should be smooth, functional, and visually appealing while showcasing the artist's unique style. Use these guidelines to evaluate molded ceramics and improve your own skills. Remember, each piece is a chance to learn and grow!

Here are some common issues to watch for when judging molded ceramics:

- Visible Seams: Poorly cleaned or visible seam lines can make the piece look unfinished.
- Cracks or Chips: These can occur during drying, firing, or handling and affect the durability of the piece.
- Uneven Glaze: Drips, bubbles, or bare spots in the glaze can make the piece look unprofessional.
- Warping: If the piece is distorted or doesn't sit flat, it may indicate improper drying or firing.
- Overly Thick or Thin Walls: This can make the piece feel heavy or fragile.

Craftsmanship

Craftsmanship evaluates the technical quality and precision of the piece.

Key Points to Assess:

- **Clean Edges:**
  Are the edges smooth and well-finished? There should be no sharp edges or rough spots.
- **Seam Lines:**
  If the mold has seams (common in slip casting molds), are they cleaned and blended properly? Visible or rough seams can detract from the quality.
- **Surface Smoothness:**
  Is the surface free of cracks, air bubbles, or dents? The piece should look polished and intentional.
- **Uniform Thickness:**
  Are the walls and base of the piece consistent in thickness? Uneven thickness can lead to cracking or warping during firing.

Design and Shape

The shape and design of the piece should be aesthetically pleasing and appropriate for its intended purpose.

Key Points to Assess:

- **Proportion and Balance:**
  Is the piece well-proportioned? For example, a vase should have a stable base and a well-balanced neck.
- **Symmetry:**
  Is the piece symmetrical, or does it have intentional asymmetry that adds to its appeal?
- **Form:**
  Does the shape of the piece look clean, intentional, and well-executed?

Guidelines for Judging Your Project

Functionality

If the ceramic piece is functional, it should serve its purpose effectively.

Key Points to Assess:

- **Usability:**
  Can the piece be used as intended? For example:
  - A bowl should hold food or liquid without leaking.
  - A mug should be comfortable to hold and drink from.
  - A vase should stand upright and hold flowers securely.

- **Durability:**
  Is the piece strong and sturdy? Check for cracks or areas that might break easily.

- **Size and Weight:**
  Is the size appropriate for its function? Is the weight balanced and comfortable to handle?

Surface Decoration

Surface decoration adds personality and artistic value to the piece. It should complement the overall design.

Key Points to Assess:

- **Texture:**
  If the piece has texture, is it intentional and well-executed? Uneven or accidental texture can look messy.

- **Glaze Application:**
  Is the glaze applied evenly and smoothly? Are there any drips, runs, or bare spots? Does the glaze enhance the piece's design and complement its color and form?

- **Detailing:**
  If the piece includes intricate designs, carvings, or stamps, are they clean and precise?

Creativity and Originality

Creativity is all about how unique and imaginative the piece is.

Key Points to Assess:

- **Innovation:**
  Does the piece show a creative use of the mold? For example, has the artist combined different molds or added unique elements?

- **Personal Style:**
  Can you see the artist's personality or vision in the piece? This could include unexpected colors, patterns, or textures.

- **Artistic Expression:**
  Does the piece tell a story or evoke emotions? Is there a theme or concept behind the design?

Guidelines for Judging Your Project

Finishing and Presentation

The final touches can make a big difference in how polished and professional a piece looks.

Key Points to Assess:

- **Footing:**
  Is the base of the piece clean, smooth, and finished? A well-trimmed foot shows attention to detail.

- **Consistency:**
  Is the piece free of fingerprints, smudges, or other accidental marks?

- **Overall Finish:**
  Does the piece look complete and ready for display or use?

Overall Aesthetic Appeal

Finally, consider the piece as a whole. How does it make you feel? Does it look attractive and well-made?

Questions to Ask:

- Does the piece catch your eye?
- Does the design and decoration enhance the overall look, or does it feel overwhelming or underwhelming?
- Does the piece look intentional and thoughtfully crafted?