



= Cat Mage DICE =

Silicone mold-making tutorial for dicemakers

This is how I personally make my silicone molds, but there are countless other methods and resources for making your own molds if this tutorial isn't right for you. When working with uncured silicone, be sure to always wear proper PPE.



- 1 2 cheap plastic cups
- 2 Baby powder or other similar powder
- 3 Dragon Skin 20 or other platinum cure molding silicone.
- 4 Brush
- 5 Marker or pen
- 6 Exacto knife or other sharp blade
- 7 Cyanoacrylate super glue (*this must be cyanoacrylate glue, as other super glues will cause cure inhibition in platinum cure silicones*)
- 8 7 toothpicks and lightweight cylinders, or alternative shapes for sprues/reservoirs
- 9 Tape
- 10 Dice masters, fully polished
- 11 Cardboard or other flat surface that will fit in your pressure pot
- 12 Hot glue gun
- 13 Sulfur-free clay such as Plasticine or Monster Clay (*this must be sulfur-free clay, as sulfur will cause cure inhibition in platinum cure silicones*)
- 14 Contact paper or other adhesive sheet

Not pictured:

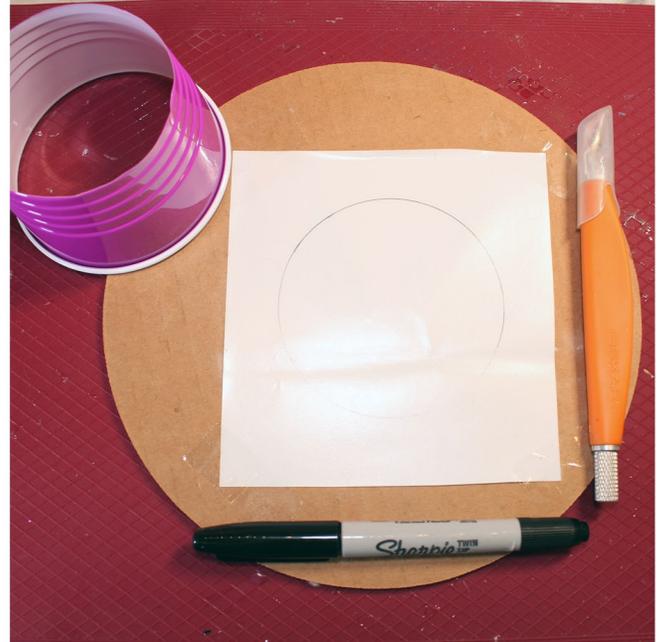
Vinyl gloves (*do not use latex gloves, as latex will cause cure inhibition in platinum cure silicones*)
 Pressure pot and air compressor
 Scale for measuring silicone by weight
 Mixing cups and stir stick
 Q-tips

Preparing your mold

Supplies: contact paper, cardboard surface, tape, exacto knife, plastic cup, marker, dice, clay

1. Peel your contact paper and lay it adhesive-side up on your flat surface. Use tape to stick the corners down so it does not move.

2. Using an exacto knife, cut both of your plastic cups in half around the circumference. Lightly lay one cup on the contact paper and trace the outline of the lip with your marker. Remove the cup and set aside.



3. Firmly stick your master dice to the contact paper within the drawn outline, making sure there is a comfortable amount of space between them. The face that is upright will end up being upside down and at the bottom of your finished mold, so keep that in mind if you have a preference for your mold direction when placing the dice.

4. Using some clay, create at least 3 registration keys by balling up small amounts of clay and pressing them into flattened discs on the contact paper. These keys will help the two halves of your mold fit together.

5. Once your dice are in place, stick the cup from step 2 back on the contact paper, using the drawn guide to re-align it.

6. Use extra clay to seal the outside of the cup and prevent any leaks.



Pouring the silicone

Supplies: silicone, measuring scale, mixing supplies, pressure pot

7. Mix your silicone according to its ratio directions. I find that about 156ml of silicone total (78ml part A, 78ml part B in silicones that are mixed 1:1 by weight) is needed for the bottom half of these molds.

Mixing tip: once you feel that you've thoroughly mixed your silicone, pour it out into a second mixing cup and mix again. This ensures that there is no unmixed silicone caught in the bottom or stuck to the sides of your cup.



8. Pour silicone into your mold without pouring directly on your dice. Allow the silicone to pool around the dice and rise up to cover them: this prevents air bubbles from getting trapped in the recesses of your numbers. Pour a thin stream from high up to reduce the number of bubbles overall.

9. Move your mold-in-progress to your pressure pot and pressurize to 40PSI, or another PSI that is higher than your intended normal casting pressure for resin. When working with a pressure pot for casting resin, your silicone mold should always be cured at a higher PSI than your resin will be cured under. This prevents warping and keeps the resin from filling in any microbubbles that might be present on the surface of your silicone mold.

10. Allow to fully cure before removing from the pressure pot.



Making sprues/reservoirs, and cleaning mold

Supplies: toothpicks and cylindrical shapes, exacto knife

11. To make your sprues and reservoirs for the lid of your mold, use a toothpick and lightweight cylindrical object. The goal is to have a thin point which will be attached to the surface of your dice, and a volume that will be able to hold extra resin when casting.

I used some hollow plastic bullets left over from a costume: I cut the bullets in half and poked a toothpick through the bottom of each bullet to create the combined shape. Going forward to make future molds, I use the leftover resin that remained in the reservoirs after casting dice.



12. Once your silicone has finished curing, remove the contact paper from your flat surface.

13. Peel back the contact paper from the mold, being careful not to pull up any of the thin silicone around the faces of your dice.

14. Remove the clay registration keys. At this stage, you can also use your knife to trim the thin flashing around the edge of your mold where the cup lip touched the contact paper. You may need to additionally trim the edge around your registration keys if they have too much of an overhang.

15. Using an exacto knife, carve out a small notch on the edge of your mold. This will be used to help line up your lid in the future, since it may be hard to orient the lid using your registration keys alone.



Prepping mold for second silicone pour

Supplies: baby powder, brush, q-tip, super glue, sprues/reservoirs, hot glue, plastic cup, clay

16. Sprinkle baby powder on the mold and use your brush to sweep it over any exposed silicone. Make sure to get into your registration keys and direction notch.

17. Clean off any excess powder from your dice faces using a q-tip or paper towel.



18. Squeeze a small dab of super glue onto a scrap surface. Apply the smallest dot of super glue to the tip of your sprue and glue it to your dice face. Repeat until all of your dice have sprue/reservoir combinations firmly attached.

19. Apply a seam of hot glue around the lip of your second cup that was cut in half in step 2. Firmly press it against the lip of the cup around the bottom half of your mold to create a container around your reservoirs.

20. Use extra clay to seal where the two cups meet and prevent any leaks.



Pouring the mold lid

Supplies: silicone, measuring scale, mixing supplies, pressure pot

21. Mix up more of your silicone. I find that about 134ml of silicone total (67ml part A, 67ml part B in silicones that are mixed 1:1 by weight) is needed for the top half of these molds. Use the same two-cup method when mixing silicone to prevent any unmixed material.

22. Pour your silicone in a high, thin stream over your dice. Allow the silicone to flow around your sprues and rise up the sides of your reservoirs.

23. Let cure in the pressure pot under 40PSI, or the same pressure as your first half of the mold.

24. Once cured, cut your plastic cups and tear them away from your silicone mold. Find the seam between the top and bottom of your molds and carefully peel them apart.

25. You now have a completed 2-part lid mold with reservoirs!



Troubleshooting and FAQ

Silicone does not cure anywhere that it touches the dice

3D-printed UV resin can continue to offgas well after the object has been cured. This offgassing can interfere with platinum cure silicones, preventing it from curing anywhere that the silicone is in contact with the 3D-printed material. You will need to let the dice masters continue to offgas until they're inert. Setting them in the sun for a few days will help them along. I've found that I usually want to wait 2 weeks before casting a 3D-printed piece in silicone, but your mileage may vary.

There are streaks or spots of uncured silicone in my mold

A number of reasons could prevent your silicone from curing:

- There was unmixed silicone left in your mixing cup or stir stick that ended up in your mold. To prevent this, pour your silicone into a second cup and mix again before pouring your mold. Do not scrape the sides or bottom of your cup into your mold.
- You're using latex gloves and your gloves came into contact with the silicone while mixing. Use vinyl or nitrile gloves when mixing silicone and when handing your dice, as I've also had latex residue left on my dice masters which caused some curing problems.
- You did not properly follow your silicone's mixing directions. Make sure you're mixing appropriately by either weight or volume.
- If the uncured silicone seems to be concentrated around one material in your mold (ie: where your sprues attach to your dice, or the surface that was touching the contact paper,) chances are that there is something within that material that's causing problems. Try a small-scale test to eliminate any problem materials and replace with alternatives.

What's the point of a pressure pot, and do I need one?

Many dicemakers use a pressure pot when casting resin. By placing uncured resin in a pressure pot and then increasing the pressure within the pot, the air inside will be compressed into a smaller volume. This has the effect of shrinking air bubbles within the resin down to a smaller size, often making them so microscopically small that they become invisible in the finished dice.

If you intend to cast your resin under pressure, your silicone mold will also need to have been cured under pressure, ideally a higher pressure than you'll be using for your resin (ie: silicone cured at 40PSI, resin cured at 30PSI.) If you pressurize a silicone mold that wasn't originally cured under pressure, the microscopic air bubbles trapped within the silicone can be compressed and deform the shape of the mold. Additionally, tiny surface bubbles on the faces of your mold can be large enough for your resin to flow into, creating a textured surface where it was originally smooth.

Plenty of other dicemakers do work without a pressure pot, and combat air bubbles by choosing low-viscosity, longer-curing resin that will allow air bubbles to pop before the resin cures.