

Mold-Making Instructions

Note: These instructions are specific to a 10:1 base:catalyst ratio silicone mold-making rubber such as Douglas & Sturgess's SR-1621. They are meant as a supplement to—rather than a replacement for—any instructions provided by the manufacturer.

Simple, one-piece open-block mold

1. Secure model (the piece to be molded) to melamine using hot glue or just a few drops of 5-minute epoxy or cyanoacrylate glue. Doing so prevents the model from moving while being molded, yet is easy to remove using a putty knife once the mold is complete.
2. Use foamcore to build a box to serve as the walls of the mold. The box should be $\frac{1}{2}$ in. larger in all dimensions than the actual model (the resulting mold will be no less than $\frac{1}{2}$ in. thick at any point). If thinner it could distort during casting. Set the finished box on the melamine and run a bead of hot glue around the outside to prevent leakage. (You may wish to leave the hot glue gun plugged in until after the rubber is poured should leaks develop.)
3. To calculate the volume of the box in cubic inches, multiply *length* x *width* x *height*. A cubic inch of silicone weighs approximately 17.5g, so if you multiply the volume of the box in cubic inches by 17.5g of silicone, the result will be the necessary silicone weight (in grams) required to fill the box.

Example:

box measurements = 5 x 3 x 2 in.

volume = 5 x 3 x 2 in. = 30 cubic in.

silicone weight = 30 cubic in. x 17.5g of silicone per cubic in. = 525g of silicone

4. Use the digital scale to weigh your silicone base. Remember to zero out the weight of your mixing cup! Before adding any thinner or catalyst, tilt and swirl the silicone onto the sides of the cup—your additives will mix in easier this way. Thinner isn't always necessary, but it is good for highly detailed molds and may make air bubbles rise to the surface more easily. If using thinner, add 10 percent of the weight of your silicone base and mix thoroughly (two large paint stirring sticks taped or glued together work well). Scrape the sides and bottom of your cup to ensure a good mix.

Next add your catalyst. Use 10 percent of the weight of your silicone base. Do not count the weight of the thinner (if used). Mix thoroughly, scraping sides and bottom of container. Mixing is complete when all marbling is gone and it is a consistent light blue color.

Example (in grams):

525	silicone base
+ 52.5	<u>thinner (10% of silicone base)</u>
577.5	running total

+ 52.5	<u>catalyst (10% of silicone base)</u>
630	TOTAL

5. Pour your catalyzed rubber slowly into one corner of the box, preferably not directly onto the model as this can trap air bubbles. Pour it slowly into one spot, letting it flow over the model by itself. (**Note:** We have a vacuum chamber with which you can remove air bubbles from your rubber before pouring. Ask a studio manager for a demo.)
6. The rubber should kick off overnight. At that point, the walls can be peeled away, and the resulting block mold can be gently pulled off of the model. If any rubber seeped under the model, it can be carefully trimmed away with an X-Acto knife.

The mold is now ready for casting.

Two-piece block mold:

1. Use a piece of melamine as a base for your work. Choose a parting line on your model. Locate this line at the halfway point on the object to avoid undercuts and to allow the cast to be easily demolded. Embed the model in a slab of clay up to this parting line.
2. Build a foamcore box to serve as your mold walls (see Step 2 for details). Position it correctly and push it into the clay slab to stamp its dimensions. Use a knife to trim away excess clay.
3. Add approximately an inch of ¼-in. wax tubing to serve as a pour spout, and top it with a half round to form a reservoir. The flat part of the half round should be at the edge of your trimmed clay slab (right up against the foamcore box once it is added). The ¼-in. wax tubing should butt right up against the model. Both should be embedded halfway in the clay slab.
4. You can use ⅛ in. wax tubing to make sprues at the thin extremities of your model. Butt them right up to the model and to the edge of your trimmed clay slab, where your mold wall will be. They also should be embedded halfway in the clay slab. The purpose of the sprues is twofold: (1) to allow air bubbles to escape during casting, and (2) to indicate this part of the mold has been filled (i.e., when your casting material overflows these sprues). Lastly, add 3 or more small half rounds to serve as registration keys to ensure the two mold halves align properly when casting.

5. Fit your foamcore box around the clay slab, then hot glue it to the melamine (see Step 2 for details).
6. Calculate volume and silicone weight (see Step 3 for details).
7. Measure and mix silicone (see Step 4 for details).
8. Pour silicone (as described in Step 5 above).
9. The rubber will cure overnight. Peel away mold walls and carefully remove clay so as not to separate model, spout, and sprues from the rubber of the first half of the mold. Clean off any residual clay. Remove small half-round registration keys. Spray all exposed silicone (top, sides) liberally with petrolatum mold release (designed for releasing silicone from itself—basically, it is sprayable Vaseline that you can use it straight out of the jar in a pinch).
10. Build a new box to serve as the mold walls for the second half of the mold (see Step 2 for details). Use hot glue to affix it to the melamine.
11. Calculate volume and silicone weight (see Step 3 for details).
12. Measure and mix silicone (see Step 4 for details).
13. Pour silicone (as described in Step 5 above).
14. The rubber will kick off overnight. Remove the model, pour spout wax, half round reservoir, and wax sprues. Use dish soap and water to wash the molds as needed. After molds have dried thoroughly, they are ready to be cast.