

6.0 Foam Latex: Making molds and casting foam latex.

Foam Latex:

There are several manufactures of foam latex. The two most well known are Burman and GM foam. Foam Latex is a multi component system that will produce a dense rubber foam with a skin for use in prosthetic appliances (elf ears etc.) and puppets. The main components of foam latex are the latex base, which is a natural rubber with ammonia as a preservative. The curing agent which reacts with the latex in the oven to "vulcanise" the rubber. A foaming agent is included which will "foam" the latex when whisked in a blender. And lastly there is a gelling agent that "gells" or sets the foam.

The process of making the foam latex will vary slightly depending on manufacturer but basically the latex base, curing agent and foaming agent are added to a bowl as per the instructions (you will need to weigh accurately the amounts so have a accurate weighing balance) and they are mixed. The most common mixers used are Sunbeam mixmasters or Hobart mixers. Most instructions discuss using these mixers. If they are unavailable to you then you will have to adjust the mixing schedule through trial and error for your different mixer.

When you "run" foam you follow a mixing schedule, which is design to produce a nice foam with an even cell (bubble) structure. A typical schedule is as follows:

Mix stage 1 min low speed Foaming stage 6 min High speed Refine stage 3min medium speed Ultra refine 3min low speed Add gel agent 1min low speed Final mix 1 min low speed

These times and speeds will be given in the instructions but will need to be varied according to temperature and humidity. You should always take note of the room temp before running the foam and always make notes so you learn from each batch you make. The refine and ultra refine stages is where the mix breaks up all the large bubbles caused during the whisking stage to eventually you should have a nice small celled foam the consistency of thickened cream.

The problem with latex is that it will vary from batch to batch. Each batch will have a slightly different ammonia content and so it will not exactly follow the schedule so you do need to take notes as you run the foam keeping as many things (eg. Temp) constant so you can produce more consistent results with subsequent batches.

My first attempt at running foam, the latex gelled in the mixer bowl doh! My second attempt gelled in the injection gun doh! My third attempt gelled halfway through injecting doh! My fourth attempt worked fine and I had a nice filled mold with time to spare.

I hope this doesn't put you off as I was working at night in the middle of a hot Aussie summer with no air-conditioning so the temperature was adversely affecting my foam. Foam latex can be expensive at first while you learn to run foam but you learn pretty quickly what works. The only main piece of advice I have noticed is that whatever amount of gelling agent the manufacturer

Stop Motion Puppet Construction 1st Edition Part 5

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says you should use (typically 12-14 grams) I would recommend using 2/3 of that amount. The gelling stage is the most critical stage. After adding the gelling agent and having a short final mix you have to work quickly (you may only have a couple of minutes) to fill your mold through the brushing method (see below) or the injection method.

This is the tip of the iceberg when talking about foam. There are different additives you can add to foam to vary foaming or flowing properties of the foam. Just make sure you are well organized, know exactly what you will be doing and have all the necessary equipment at hand. Follow the basic instructions in the manufacturers instructions and then vary these as you learn.

Eventually you'll learn to love foam! It is a real nice feeling to pull a well made foam latex puppet from a mold and they are great to animate.

Mold making:

PART I: the easy inexpensive mold for beginners.]The following is an easy way to make a mold and cast a puppet for a beginner. This process requires less equipment and less expensive materials than PART II. Just remember, baking latex in Mom's oven is a very bad idea. It smells awful, and could leak noxious fumes. If you don't have access to a non-kitchen oven, we recommend you find another way to make a puppet! The only other rule is to alternate between hard and soft when going through the mold-making process. That is, soft sculpture for a hard mold, or hard sculpture for a soft mold. Latex puppets may be pulled out of hard (ultracal) or soft (silicone) molds.

STEPS for PART I:

1. Build a very stiff (pretty much un-bendable) armature the correct size for your puppet. We often use a thick wire coat hanger for this. Incorporate a scrap wood block for the chest (more on this later). Do not make feet, instead mount the leg wires directly into the board you'll be sculpting onto. Use 5-minute epoxy and screws to make sure the wires are absolutely secure. This armature needs to support your puppet horizontally when you lay it down to do the first half of the mold. Sculpt your puppet in a neutral position with its feet flat, floating about 2 or three inches above the board, as you need to be able to surround the entire puppet with the mold. Use traditional artist's wet clay or oil-based non-drying artists clay. Plasticine is too sticky. Make your puppet as perfect as you can, since molds capture every detail including stray fingernail marks! "Neutral position" means that every limb is positioned at a midpoint in its normal range of movement, so that the foam is not distorted too much during the animation. Make sure that fingers are splayed and hands are flat on the same plane as the body, otherwise fingers will be locked into the mold.

Stop Motion Puppet Construction 1st Edition Part 5

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2. Animals on all fours will need a three piece mold, one for the belly and inside the legs, one for the right side and one for the left side. Bipeds will need a two piece mold, front side and back side. Consider where to divide the puppet in order to get the pieces of the mold apart without having them lock together, and without any overhanging lips or edges on the mold that may break off. If you're not sure what we mean here, imagine this: picture making a mold of the earth. It'd be pretty hard to pull the mold apart if the bottom half went up past the equator, wouldn't it? Since you have a soft sculpture, things like folds in clothes and noses will probably come off the sculpture when you pull the mold off, but the foam will also pull out of those areas with no problems.

3. Lay the puppet on its back. Place some clay or blocks of wood under the puppet's back (under the chest block you mounted in the armature) to support the weight of the mold that will soon be on it. Here's where you find out if the armature you built was strong enough! Build a clay wall 2 or 3 inches wide at exactly 90 degrees to your puppet. The clay wall will follow the contours of the puppet and always be at 90 degrees at each point along the puppet's body. One side of the clay wall will line up with your imaginary half way line. This side should be smooth and join cleanly to the puppet with no little spaces. The other side will have balls of clay or whatever it takes to support the wall. Sometimes we find it easier to make the wall out of clay of a different color than the sculpt, then you'll know if you get it all off later. Now you have a puppet that looks like he's swimming on his back in a sea of clay, with his palms up and clay between all of his fingers. The second clay wall, to keep the ultracal from pouring over the edges, is built perpendicular to the first about 2 or so inches from the puppet (higher if the puppet is especially thick). Now he's floating in a well! It should be about 2 inches high. It doesn't need to be pretty but it does need to join tightly to the first wall.

4. Now you need to place keys around your puppet. Keys are what we call the bumps in a mold that help you to match it back up when you put it together again. Make a few bumps thumbnail size on each side of the puppet in the first (flat) clay wall. Make them sloping and smooth so they will help the mold fit together without locking together. Make sure they don't contact the puppet in any way.

5. Spray your puppet and the clay walls with a couple of coats of Krylon's Crystal Clear (a clear coat for artists) or brush a very thin layer of vaseline on with a smooth flat brush. Don't leave any brushstrokes on your puppet as these will be picked up by the mold. This coat helps to separate the clay from the ultracal later.

6. Now for the mold! Mix up your ultracal to the consistency of thick gravy. Estimate the amount of water it would take to fill up the well you have built, and start adding the ultracal powder to that. After a few molds you will be able to more easily guess the amount to mix, but in the beginning it's best to have a bit extra. Mix it with your hands and make sure there are no lumps. You have about an hour to work before it really starts to set up; we usually find ourselves waiting for it to harden before we dress it! If it is too thick, it won't flow into the crevices of your sculpt so add a bit more water if you need to. **IMPORTANT:** once the stuff is mixed up, it begins a chemical reaction. Don't add any more water or powder once you've got it totally mixed up. Also, wear a dust mask. This stuff will set up in your lungs if breathed in.

Stop Motion Puppet Construction 1st Edition Part 5

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7. Gently pour some of the ultracal into the mold. Make sure it is getting into the crevices. You may need to very carefully put your finger or a long soft paintbrush onto the puppet to force the ultracal into the cracks and folds. Alternately, use a drinking straw to blow the mix into the low spots. Keep filling a bit at a time making sure that there are no bubbles on the surface of the puppet. Fill the mold making sure that the highest point on the puppet is at least 1/2 inch under the surface of the ultracal.

8. Wait until the ultracal begins to set up. Now it is like oatmeal, and you can pile it up on the high points if you want to, keeping the overall mold thinner than if you just filled it up. As it sets up hard, be sure to dress the mold. Use a damp cloth and wipe the surface of the mold smooth so it won't have any sharp points later. Wait until it's almost set up though, otherwise you'll cause cracks in the not-quite-set mold. Just before it's rock hard, pull off the vertical clay wall and use your cloth to rub off the top edge of the mold so it's not so sharp. Now, don't touch it for a few hours! During this time it will heat up dramatically and cool off. When it is cool, you're ready for the second half.

[Part 4](#) | [Part 6](#)