

[SQUEAKING] [RUSTLING] [CLICKING]

JUSTIN

LAVALLEE:

Hello, my name is Justin. We're going to do a quick project together today to cast a reproduction of a figurine using a simple two-part mold. And we're going to look at how to do that. This is the kit of materials that you've been sent that you'll need to complete this exercise.

You should all have a cord of this Alja-Safe material and a pint of plaster of paris, along with some dust masks and gloves, some modeling clay, a knife, tape, some cardboard boxes, safety glasses, scissors, a ruler, this figurine that we'll be molding around, and a cutting mat to work on.

We're going to first set up the box-- and you'll see all this in video-- and add some clay to it. We're going to embed the figurine in it and build up clay to what's called the parting line. And there's another diagram that will explain that concept.

And once we have that set up, we'll cast Alja-Safe, which is a skin-safe molding material, into the top half of this mold. And we'll allow it to cure. Then we're going to flip the mold over. We're going to take the bottom off, remove the modeling clay, and cast more Alja-Safe in. And what this is going to give us is a two-part mold that we can open and close and use to cast the plaster into that will make the reproduction.

So here we are. We open the mold. We take the figurine out, close it again. We cast plaster into it. And once the plaster cures, we have our reproduction.

The first step is to prepare the box. Now, the first thing I did was figure out how to fold it. We're about to cut it in half. And it's a little more straightforward to understand how it goes together, for me, when it's in the hole. And then later, when I cut it in half, I can see how the half assembles.

So here we go. Flip it over. And I'm going to take the ruler and start measuring to find the center. The ruler is not long enough to measure the full width of the box where those flaps are. So I measure up here, where the box is narrower, find the middle.

The ruler is also not long enough to cut the whole box in one go. So I'm actually going to make three marks and make sure that the marks are all close enough to each other that when I flip the ruler around, here, I go and measure from the opposite side in case I did any-- had any errors in my division.

Make sure the marks are in the center. So it was 3 and 5/16 inch off that edge to find the center line. And here I am with the ruler. And I've got two marks on the edge of the ruler. I'm going to take the knife, make a cut. This is a safety knife. So it will close, if you let go of it. You can't leave it open and accidentally hurt yourself.

So I cut as far as I can, make sure it's cut through. I'm going to shift the box along so that I'm still over the cutting mat. You don't want to cut on top of a table or another nice surface that you might care about. So we sent you the cutting mat, so you can do your cutting without damaging whatever's underneath.

Flip the box back over. Remember how to fold it up when it's a half box. And here I go. Hold it together. Close this side. Close what was the top. And we've got a nice half box. The reason I did this is because the whole box was quite a bit larger than the figurine. And it would have needed a lot of the Alja-Safe material to make our mold. And most of that would have been not contributing much to the process. So we're going to save a lot of Alja-Safe material here, which gives you enough that you can do this process more than once if you wish.

Here's a quick concept called draft angle. So if you have something that you're trying to pull out from a parallel mold, it's either going to jam, or it's going to scratch the part, or you're going to have problems. Draft angle is this little bit of angle between the direction that you're extracting the part and the mold walls. A parting line is a concept that relates to where the two parts of a two-part mold will come apart. That's a lot of the word part in one sentence.

Anyhow, if you refer back to that initial set of diagrams, this is the start of our process. And I'm putting a layer of clay down into this box. It doesn't matter a whole lot exactly how thick this is. I ended up using about a quarter, about a half pound here because we've got two pounds. And this was a one-pound bar, half of the shipment. And I broke that in half.

And I'm measuring just to make sure that the figurine is roughly going to be in the center of the box when I put it in here. So I measure the box, see where the depth of the clay is, the thickness of the figurine. Then I push it into the clay. And you'll notice that the base of the figurine is right up against one side of the box, nice and snug. And then I start working the modeling clay into these cylinders that I can work down in around. And I'm building the clay up to the height of the parting line.

We'll see here soon that I use the ruler. And this is just to push down the modeling clay to the parting line in the little crease between the body and the head of the figurine, where my finger is a little bit too thick to get in there. So that's what I'm doing here. The rest of it, I'm just molding with my finger. And then I'm going to make two dimples in the modeling clay.

And these are what we would call registration features. So the surface is fairly irregular. And the mold should fit the two halves together pretty well anyhow. But those two dimples are going to really help us to make sure that part 1 and part 2 of the mold can only connect to each other in one very exact manner, so they line up correctly.

I was intending to send you a wooden stir stick, but I forgot to include them. So I ended up making one out of cardboard, very straightforward. Just slice off a piece of cardboard from the shipping box. The original one I made was the cardboard from the back of the knife packaging. Fold it a few times so that it's a little bit stiffer. Wrap tape around it. If it gets saturated with water, or it bends, or something else happens to it, then you can just make another one pretty easily.

You'll notice that this video is all sped up quite a bit. So it's not in real time. So don't expect to work as quickly as I appear to be working. The other thing I did, as I was going along, was to take the two powders, the plaster and the Alja-Safe, out of the containers that they were shipped in and put them into the plastic bags because we're going to use the two containers as mixing containers, which you'll see shortly. And the Ziploc bags are a nice place to store the powder and keep them dry and clean.

This is important. You should read the technical data sheet completely so that you get the instructions on mixing and how to use the material. The Alja-Safe is mixed by volume, typically one part by volume of warm water to powder. You put the water in the cup first, and then you add the powder to it, and then you stir. It's pretty forgiving. So the ratio doesn't have to be perfect.

Here, I'm turning this container into a crude but effective graduated cylinder by just adding strips of tape so that I can see how much water to put in the container. So I'm going to put two tape-widths of water and two tape-widths of Alja-Safe. And this amount worked out perfectly for me. If you had less clay in your box, you might need a little bit more Alja-Safe. So if you want to be on the safe side, you can do 2 and 1/2 tape-widths of each. Add water to the height of the second tape.

Add a scoop full of powder. I had this extra container around. You could also carefully dump the powder from the bag into the mixing container. Note that I'm wearing the latex gloves. And it's also good to wear a dust mask. If you can do this outdoors or someplace like a garage that's away from area in your house that you might want to keep clean, that's good.

This powder is not toxic. But generally speaking, it's not good to inhale any type of dust. So if you can avoid doing that, you see, I'm making a tiny bit of dust. If you're careful with your stirring, you should be able to stay pretty clean. It's important to note here, I'm scraping the walls of the container to make sure there's no pockets of dry powder. And I'm going to scrape back and forth across the bottom of the container also to make sure that the water is fully incorporated into the powder and there's no clumps in here.

Like I said, the Alja-Safe is pretty forgiving as far as ratio. You have only about 5 minutes of time to get it mixed up, though. If you wait longer than that, or you forget some step, or you have to run and do something, it's going to harden in the mixing container. So you want to be able to do this quickly, have everything set up out and in place before you start for this step specifically.

So here I am, scraping it all into the top half of the mold, right on top of the figurine. You don't need any kind of mold release, which you would probably need with other casting materials, to help prevent what you might be using from sticking to the thing you're casting it onto. But this Alja-Safe typically doesn't stick. So it goes in there. And it'll come off nicely and cleanly after.

I'm also wearing gloves, which you saw me take off. The material's not hazardous to your skin. I'll just say it is, in fact, a life-casting material meant for making reproductions for costume design and that thing of people's-- it's meant to be in contact with your skin. So you don't have to worry about any hazards when using it. But if you don't want it on your hands, we've sent you some gloves.

The same goes for the plaster and the modeling clay-- not hazardous to touch. But if you don't want it on your hands, you want to stay a little bit cleaner, please feel free to wear the gloves. If you don't wear the gloves, you're not at any risk.

So here I am. I've cut the bottom off the cardboard box. And I'm pulling the modeling clay out. So I flipped it over to make sure that the Alja-Safe was still secure, where I cast it in the top. And I waited about 10 minutes after I cast it. You do want to do the two steps of casting Alja-Safe and the step of casting plaster all on the same day.

The Alja-Safe is going to dry out, and start to shrink, and possibly crack. It's going to depend somewhat on temperature and humidity. But it is a temporary mold material. So this mold is only going to last through this exercise. You couldn't reuse it in a week or a month.

Here, I've pulled all the clay out. The Alja-Safe is still in there. The figurine is still embedded safely in the Alja-Safe. Just quickly, you want to pull all the hardened Alja-Safe out of your container before you use it for mixing again. I noticed that the second side in my particular exercise here was a larger volume than the first side. So I know I'm going to need more Alja-Safe. So I've added two more lines of tape to the mixing container. I'm going to fill water to the third line, and then powder up to the sixth.

Same process, though. Get the Alja-Safe in on top of the water. It's a little bit more volume. So there's a little bit higher chance of stirring up dust. So I went a little bit slower this time when I'm doing the mixing to keep the dust down as much as possible. You can still see a little bit.

Once it's incorporated enough that there's not much loose powder to make dust, I speed up the stirring. I scrape the walls. Again, I scrape across the bottom of the container to make sure there's no dry powder clumps, just like the first time. Once it's nicely mixed, I'll just pour it in on top of the figurine.

Now, there are steps we could take to be a lot more careful here to make sure we don't trap air bubbles. We'll see in the final product that I have some air bubbles. But I'm not worried about that for the purposes of this exercise. 10 minutes pass and we're ready to pull the cardboard off. The second side of Alja-Safe has hardened or cured. Cardboard sticks to it a little bit, but that's not a problem.

And we crack open the mold. And you can see the figurine releases nicely from one side. And this is just an open bottom mold. So we're going to be pouring right into the figurine. There's not going to be any runners, or gates, or any other elements to the mold that you would typically see in a more sophisticated molding process or something like injection molding or metal casting.

Here, I'm just going to reuse part of this cardboard. When I wrap, I'm going to wrap tape around this mold. And the Alja-Safe is a little bit soft and rubbery. And I don't want the tape to cut into the mold. And it also doesn't stick to the mold very well. So having this little three-sided semi-box of cardboard just helps the tape stick and helps give some structure to the whole thing to make sure it's not squeezed in a way that distorts the form inside.

A few pieces of tape to secure it. It still didn't feel great. So I decided to wrap a couple pieces of tape all the way around all sides, so the tape comes back around and sticks to itself. You can see the tape peeling from the shorter pieces down below. So I'll do that with two passes, I think, yeah.

Again, the technical data sheet is important. Mixing plaster is sort of an art form. And I didn't do it perfectly. You can try to do it by weight. And you'll get a pretty good result if you have a scale that's in the right range here. But most professional plasters are never going to have a scale involved with mixing plaster. So I had a lot more here than I needed. But I was just trying to figure out how much water would be enough that I would be sure that I wouldn't run short.

Now, what you see here is I'm carefully sprinkling the plaster in a little bit at a time. And I'm trying to let it soak in. This is an important part of the process. You don't want to just dump all of your plaster in one big pile. It's just not going to work very well.

Some people would be sifting this through a sieve, a fine mesh screen of some sort, in order to really make sure that it's loose powder and there's no clumps or chunks. But for this purpose, we'll be OK like this. Now, one way that you can tell when you have enough powder is that these little floating islands of powder take longer to disappear. I don't know exactly how long they're supposed to take. I end up with a mix that's a little bit wetter than I wanted, which we'll see at the end.

But what I did was stir it up. And I could feel that it was pretty thin. It felt pretty low viscosity, not much more than water. So I realized I needed to add some at this point. And I start sifting more back in. And I decided that this was probably good. It turns out that a little bit more powder would have been-- yeah, I guess I give it one more go.

Now, unlike the Alja-Safe, which you have to cast as quickly as possible, you actually want to mix the plaster up thoroughly and then let it sit in the container for 5 or 10 minutes at least to really saturate before you pour it into the mold. So you won't see that in this video. But I did let it sit for a little while.

I'm going to pour it in. I decided to add a little bit more. And then I decided I didn't want that cap of extra plaster on top of the part. So I scraped it back off. And this is going to take anywhere from 30 minutes to an hour, maybe longer.

Now, the first sign that I had too much water is that water has come out of the mold. And it's on the cutting mat. The other thing is that there's an indentation in the bottom of my cast part. Well, what was the top in the casting and will be the bottom of the figurine when it's sitting on a table.

And that's because the plaster powder settled. Some of the water leaked out. And then there was a little puddle of water on top of the part that I cast. Here I am finding out where the mold opens, pulling it back open, and releasing the part. And of course, it's got some chunks on the outside, which is where there were air bubbles in the mold, and a little bit of an extra ridge where the parting line was. But on the whole, for a quick exercise, it seems to have worked pretty well.