

Casting in Plastic

You must use spray mold release or the casting plastic will deteriorate your mold! It does this in two ways. Casting plastic (urethane resin) pulls the moisture from the mold which makes it more brittle (and will eventually crack). Also, the isocyanate in casting plastic attacks the mold.

Spray mold release will extend the life of the mold greatly. So far, I've gotten **50 casts from a mold with no apparent wear** on it using casting resin. However, **results may vary** depending on how well you spray the mold, what brand of mold release you use and what type of casting resin you use.

For most of the molds, I would suggest using dental plaster. Casting plastic is more expensive and a little more trouble to use. However, there are molds which require casting resin to get good results (such as mold #46, the gothic graveyard mold).

Preparing a Mold for Resin

For this demonstration, I will be using a product called **Smooth-Cast 300** from www.smooth-on.com/plastics.asp. However, this **doesn't mean that this is the best product to use!** It just happens to be the one I've tried out and found that it works well. There are simply too many products out there to review them all.

1. The mold release agent I'm using is called **Universal Mold Release** and you can find it at www.smooth-on.com/releases.asp.

At the end of this article, I will review a couple of products and tell you where you can find them. I also intend to add a section on casting resin to the "Customer reviews of US products" page.



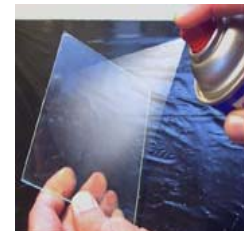
2. **Tape a piece of plastic** or trash bag down onto your work surface. The liquid plastic will spill over, and it's much easier to get it off of a trash bag than to scrape it off of your table. **Be sure your work surface is level!**

Spray the plastic with mold release. The kind of mold release I'm using is Smooth-on's **Universal Mold Release**.



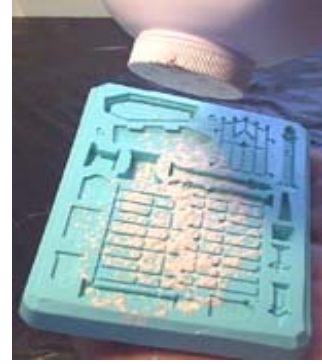
3. You'll need a **piece of glass** large enough to cover the face of the mold. The easiest way to get a piece of glass is to buy a small picture frame at Walmart (it only costs a couple of dollars).

Spray the glass well with mold release. This will keep the casting resin from sticking to the glass.



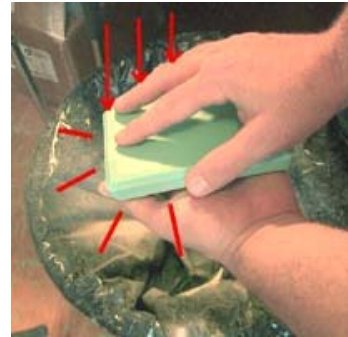
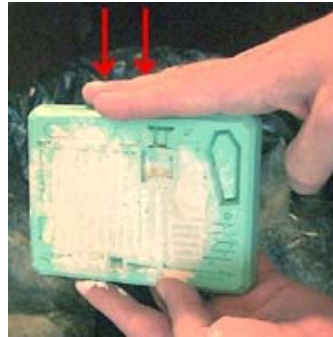
Spray the mold with mold release. Be sure to cover the entire face of the mold. Mold release will protect and add silicone back into the mold.

4. **Dust the surface** of the mold with **talcum powder**. Talcum powder will help the liquid plastic flow into all of the small crevices and details of the mold.



5. **Hold the mold over a trash can.** Tilt the mold and **tap the sides** to spread the talc around. Turn the mold a $\frac{1}{4}$ turn and tap the next side. Continue all the way around until the talc covers all of the pieces in the mold.

Turn the mold upside-down and **smack it face down** onto your hand (over a trash can). This will knock the excess powder out of the mold.



Mixing and Pouring Resin

Measure equal amounts of part A and part B. I'm using 3 ounce cups. You only need about 1/2 ounce in each cup to fill this mold (#46 gothic graveyard).

1.

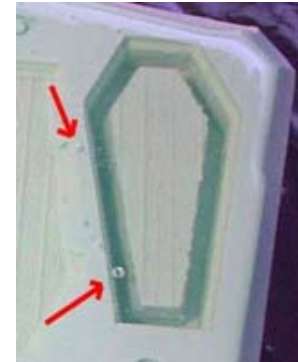
Pour them together and stir with a stick. I'm using craft sticks I purchased at Wal-mart (in the craft department).



Pour the resin into the mold. You'll want to **cover the entire face of the mold** with resin.

2.

You'll notice small air bubbles coming to the surface. **Spray mold release** on top of the mold **to break these bubbles!** They could cause problems later on if we don't get rid of them.



Now for the piece of glass. Be sure to put the **sprayed side of the glass facing down!** If not, plastic will stick to the glass making it difficult to remove the pieces.

3.

Place a piece of glass over the mold, **setting down one end first.** As you hinge the other side down, the **excess resin will squeeze out from under the glass,** pouring onto your work surface.

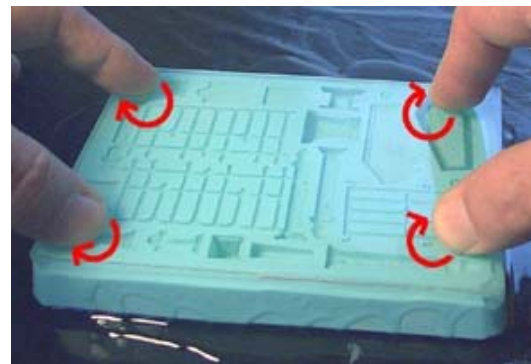


Press down hard on the glass and shove the glass around in a circular motion to remove the excess casting plastic.

4.

You want **as thin a layer as possible** of plastic between the glass and the mold. If too much plastic is left between the glass and the mold, then trimming the fence pieces will be more difficult.

The excess plastic will spill over onto your work surface. Once it hardens it can be removed easily. **Let this set for 15 minutes.**



Removing and Cleaning the Pieces

Once the **mold has set for 15 minutes**, the plastic will have hardened but it will **still have a little flex** to it. You want this flexibility because it will keep the fence pieces from breaking as you remove them from the mold. **If you are using a different casting resin than I am, the setting time will be different.**

1.

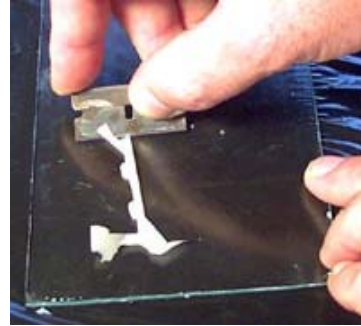
Since we sprayed the work surface (trash bag) with mold release, the mold and excess plastic will pull off of the surface easily. **Remove the ring of excess plastic** that formed around the mold when it squeezed out from under the glass.



Remove the glass from the mold. If you sprayed enough mold release on the glass, it should pop off easily.

2.

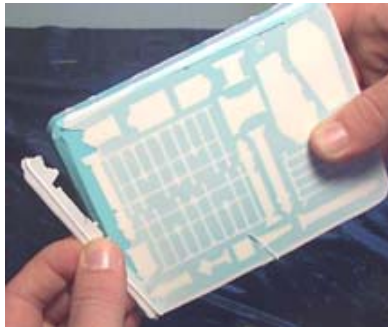
Sometimes plastic will stick to the glass anyway. To remove this excess plastic, **use a straight edge razor** or glass scraper. You can find these at any hardware store in the paint department. **Do not scrape toward your hand or fingers!**



Remove the excess plastic around the side of the mold.

3.

Start removing the tombstones that set around the outside of the fence pieces. With these pieces out of the way, it will be easier to remove the fence pieces.



Break the two fence sections apart. To remove the fence and post as one piece, **start at the bottom corner of the fence post.**

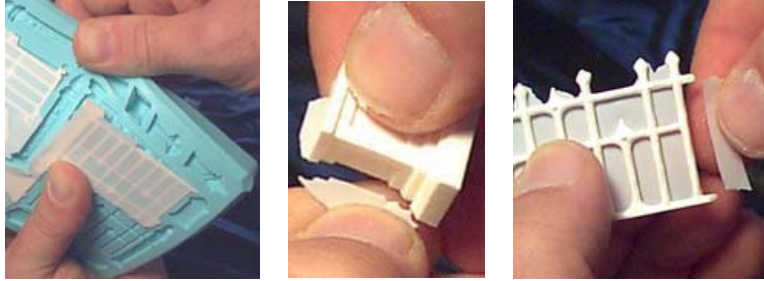
4.

Flex the mold away from the bottom of the post. **Try not to bend the fence or post.** Remember, the molds are meant to flex, not the plastic pieces you cast in them.



Remove the other fence section and post in the same manner.

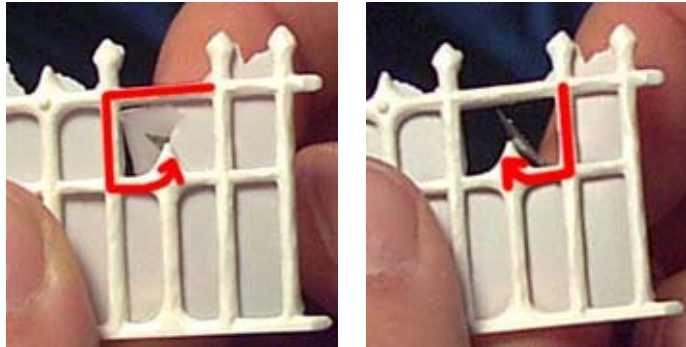
5. If you pressed hard enough on the glass when casting, the excess flash (left over plastic) should be **very thin and easy to break off**.



To **remove the excess flash** from the inside of the fence sections, use an x-acto or hobby knife.

6. **Poke the knife up through the thin plastic and trace around the inside** of the fence with the knife.

The flash should be so thin that the knife will easily trim off the excess with little or no pressure.



This finished fence section only took me **90 seconds** to trim out from start to finish.

Here is a sample of the plastic cast pieces from mold #46. The skeleton in the coffin is a Warhammer(TM) figure from Games Workshop.



- 7.



Basic Information about Casting Resin

Here are a **few terms you might want to know**. They will help you decide on what type of plastic to use. **I've only listed four that are the most important to me**. If you go digging for information you'll find a **bunch** of other factors that I haven't listed here, but for what we do they really aren't as important.

- **Mix Ratio** - Most are equal part of A and B (mix ratio of 1:1).
- **Pot Life** - The amount of time you have to pour it into the mold after you mix it up.
- **Demold Time** - How long you have to wait before you can remove the piece from the mold. The thinner the piece is that you cast, the longer you have to wait.
- **Viscosity** - How thin the mixture is when you pour it. Viscosity is measured in Centipoise (cps). The higher the number, the thicker the mixture is. Water is from 1-50cps. Corn oil is from 50-100cps and honey is from 2000-3000cps. The thinner the casting resin, the more easily it will pour into the details.
- **Tensile Strength** - How much you can bend a piece before it breaks. The higher the number, the more force it can resist before breaking.

Types of Resin I've Used

These are a few types that I have tried out. **It doesn't mean that they're the best**, it just means that I haven't had time to try out any others.

Smooth-cast 300 from Smooth-on - My favorite casting resin so far.



- **Mix Ratio** 1:1
- **Pot Life** 3 minutes
- **Demold Time** 10 minutes
- **Viscosity** 80 cps (almost water thin)
- **Tensile Strength** 3000 psi
- **Cost** 2 pint kit is \$21.00, 2 gallon kit is \$62.60

Smooth-on's web site is at www.smooth-on.com or you can call them at 1 (800) 762-0744. You can order a trial sample directly from them, but you'll have to find one of their distributors or order anything else (which

is easy to locate on their web site).

Advantages: It's water thin, which helps the plastic flow into all the details. Bubbles also pop easily because the mixture is so thin (especially with a quick spray of mold release). It sets up quickly. The pot life says 3 minutes, but don't believe it. If you don't get it poured in 1 minute then you might as well forget it. Once you pour it in the mold, it sets up and can be removed from the mold in about 15 minutes. If you wait longer than that, the pieces slowly turn more brittle and are harder to remove from the mold without breaking.

Disadvantages: It's a little more brittle than other plastics I've used when fully cured. It's also fairly expensive.

Hardcast 300 from Silpak - My second favorite casting resin.



- **Mix Ratio** 1:1
- **Pot Life** 3 minutes
- **Demold Time** 30 minutes
- **Viscosity** 150 cps (consistency of milk)
- **Tensile Strength** 2389 psi
- **Cost** 2 pound kit is \$5.78, 2 gallon kit is \$63.04

Silpak's web site is at www.silpak.com or you can call them at 1 (909) 625-0056. You can order the product directly from them, but they prefer to sell to distributors.

Advantages: It's not quite as thin as the smooth-cast, but pretty good. The bubbles don't pop quite as easily, but spraying mold release will get rid of most of them. This product is very durable (pieces will flex instead of breaking) so they hold up a little better than the smoothcast. The price for the 2 pound kit is the cheapest I've seen for casting resin.

Disadvantages: The company will fill the order for you directly, but prefers you go through a distributor. But since they don't have an organized distributor list, that makes things a bit awkward.

Alumilite Super Light Liquid Casting Plastic



- **Mix Ratio** 1:1
- **Pot Life** 90 seconds
- **Demold Time** 5 minutes
- **Viscosity** 190 cps (consistency of thin honey)
- **Tensile Strength** 6000 psi
- **Cost** 28oz kit is \$30.25, 2 gallon kit is \$94.00

To order, call the Alumilite company at (800) 447-9344 and order it directly from them. They have a web site at www.alumilite.com, but you can't order online.

Advantages: It sets up quickly. Once you pour it in the mold, it sets up and can be removed from the mold in about 5 minutes so you can make lots of copies quickly. Thin areas and small sharp edges take longer to cure. It's also the strongest material I've used so far.

Disadvantages: It's thicker than the other casting plastics I've used, so you might have a problem casting fine details or undercuts. Bubbles are also difficult to get rid of, because they don't pop easily. Combine that with a very short cure time and you don't have much time to get the material into where you need it. It's also one of the more expensive plastics I've used.

There are hundred of other products available. To find them on the internet, type in the words "casting resin" on your favorite search engine. I'll try to update my customer reviews page in the future to include different types of casting resin.