# Metallic Casting for All Your Steampunk Needs

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*Creating metallic parts for your Steampunk costume doesn't require a fully-equipped metal shop, just a little know-how and some easy-to obtain materials. Our experts show you how.*

Casting metallic pieces without having to use a smelter or melting pot is a good trick if you know how to do it and have the tools and equipment. The best method we have found so far is to use metallic powders ("metalizers") while making resin castings of parts.

We will show you three methods to achieve this, with the third being a combination of the first two. Which one to use depends on the effect you want to achieve and the material you will be casting in.

For those of you who are not familiar with it, casting resin is a type of plastic that begins in a liquid state and, after mixing, hardens to a solid finish. You make it by mixing equal amounts of resin and an accompanying hardener. After being poured into a specialized mold, the resin undergoes a chemical reaction that causes it to cure to a hardened state. This curing process creates a finished, hardened object that is an exact replica of the mold in which it was cast.


Before we get into casting metallic pieces, we first need to look at how to make a mold.

## *Making a Mold*

There are many ways to make a mold. Like most of you out there, we have our preferences and will show you the one that works for us. Although it may seem complicated at first, making a mold is straight-forward if you work slowly and follow a few basic techniques.

For most small thin pieces we prefer the "slab mold" method, as this allows us to have a mold of many parts that can be cast at one time, or as we need them. If the part is larger, there are other techniques to make the mold — another article for that one!

An open back mold for surface details is basically what we are talking about. Start simple. You can use small Tupperware containers or make a "box" by using scraps of plastic, at least ¼" thick and hot melt gluing them together (we have used masking tape to hold the box together).

Make it at least ½" to 1" larger all around to begin with (as you get better you can get closer than 1"), make it at least 1" taller than the tallest part of your master tool (what you are trying to copy). You can also use pre-made molds that come in kits.



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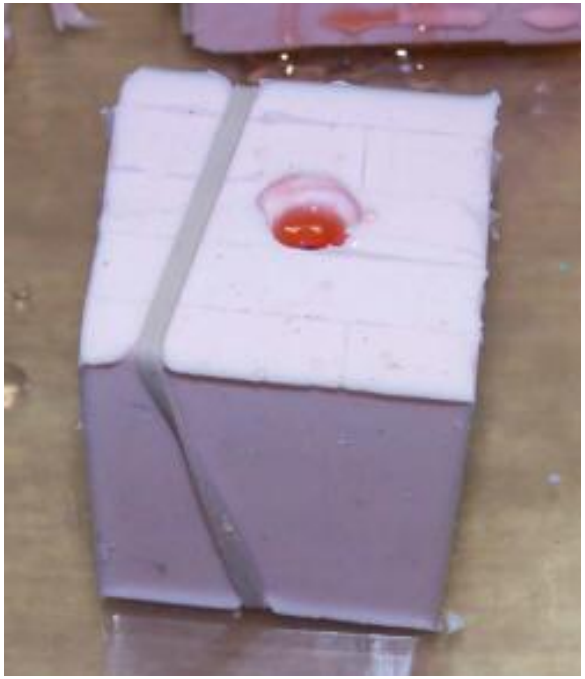

We use silicone molding compounds, typically tin-based or platinum-based. We get ours from Douglas & Sturgess in San Francisco, California. They offer classes on how to make molds, which we recommend. Hands-on-learning is best, since you have a competent instructor to show you how, and to correct any mistakes you may make.

The tin-based molding compound is for resins while the platinum-based molding compound is for casting anything up to and including white metal. We have never used the room temperature vulcanizing rubbers from Tap Plastics (after seeing the results — not something recommended).

The typical ratio of silicone to catalyst is 10:1 by weight, but follow the instructions that come with the product as they are all a bit different.

Some people use a vacuum pump hooked up to a pressure/painters pot to get the silicone as bubble-free as possible after mixing. Since the silicone takes about a day to cure when mixed in the proper proportions (some can get it to “kick” faster by mixing in more catalyst), you have plenty of working time to pour it. Since vacuuming is mostly done for pressure casting of resin, we can skip this somewhat costly step.


Take your freshly mixed silicone (do NOT taste the pink or blue frosting, which is what it looks like) and pour it in a thin stream onto the part that you are molding (remember to have the part in a box or

Tupperware container, double-sided tape or rubber band to hold it down).

The higher you can hold the cup over the mold the better. If you can do this indoors (it is very safe to use the silicone inside, some resins are better prepared outside) get a ladder and do it from 4 to 7 feet or higher if you can. Seriously. Keep kids and pets away from the area as this stuff should not be taken internally and you don't want anybody opening doors and creating drafts inside.

The mold will be ready after about 24 hours. If you wait a little longer than this it will not hurt anything. Carefully de-mold the part by removing the silicone from the box, or by taking the box apart to reveal the part that you molded. Carefully remove the part from the silicone by gently pulling or bending the silicone. Try not to break your master part; you will want to keep this safe for when you make another mold.

Silicone molds last from 12 to 24 pulls (castings) depending on the complexity of the piece and the level of detail captured. Silicone can capture fine sanding marks like good alginate can capture skin detail and pores. Let the mold sit for a few hours before you start casting so the silicone can finish curing on the molded side (part you are copying). If you need to start casting right away (deadline looming…) go ahead; you just won't get as many pulls from the mold.

Time is also a factor: silicone molds die with time. If you only cast one or two of a part per year, there are ways to save on the silicone by using used silicone from dead molds, but that is a tale for yet another article. That or cast pieces until the mold goes and store the extras for later use. You'd be amazed at how many things get "re-purposed" into a new prop or costume for another event…

## *Casting Metallic Parts*

Now we are ready to start casting metallic parts. We suggest starting small so as not to get in over your head (that would be way too big a part to cast in one piece). If you want to cast up many small pieces, you can mold them at one time in a "slab" mold and mix larger batches of resin. This is good as a larger batch of resin is easier to mix in the correct 1:1 ratio by volume.

For gears or other semi-flat details you are likely going for steel, iron, bronze, brass, or copper effects. The powders you can also get at Douglas & Sturgess, or you might be able to locate a source online (see the supplier list at the end of this article). The important thing to remember is: these are metal powders, be

careful not to inhale them or have any exposed flames nearby as the powders are highly flammable.

## Method 1

The easiest method to experiment with is to try dusting the inside of the mold with the powder after you have sprayed in a mold release agent, also available from Douglas & Sturgess (or TAP Plastics if you are desperate). After brushing in a bit, or pouring in a small amount, shake the mold and tap it out so there is no excess inside.

The casting resin we tend to use is called Ultracast or Instacast — use what you are comfortable with or are experienced with. These cure to an opaque white or off-white. The metal dusting technique can work well to provide a better surface to paint on. If the item gets lightly scratched or scuffed you see the metal surface underneath.

## Method 2

The second method is to add the metal powder directly to the resin while it is being mixed. The recommended proportion of metal powder to resin is about 10% (check with the manufacturer of the resin to see what ratios will still catalyze) up to almost 20%, though you might get more with experimentation.

In addition to adding the powder to the resin you can also add a bit of resin dye to the mix as well. Black dye added to white resin will give you a range of grays to almost black. Again, experiment with ratios of powder and how many drops of dye give you a nice grayish steel or blackish iron effect. For copper or bronze you can add red, orange or yellow dye with the copper, bronze or brass powder for different effects.

## Method 3

The third method is to combine the other two: dusting the inside of the mold with powder and mixing it into the resin (with some dye for a much better effect). The parts may still need to be painted and weathered, but you will have a piece that when scuffed or scratched will still resemble metal. We prefer this method as we can get a good coat of metal on the surface with some metal within the resin itself so even if we have to sand the piece prior to painting it, there is still some metal.

If you really need the part to be metallic without having to prime and paint it, we recommend that you get a metalizer paint and use that with a buffing cloth to really make the parts metallic.

Having a high content of metal powder in the resin (probably nearly 25%, though don't quote us on that number — but hey, go for it, just might be a good value) will give you the base finish you need. Add in some metallic paint that can be buffed to a metallic luster and then weathered to look worn, aged and oxidized… oh my.

For an unusual effect you can try using the metal powder with clear resins. Add a touch of colored dye to the resin as well… talk about unusual properties!

## Final Thoughts

Whichever method works best for your project and pocketbook, you can see the infinite possibilities for the item and its appearance. Casting in general is a fun process and including the metal effects adds to the adventure. Go forth and pour!

Left wrist cuff of flight suit costume from Battlestar Galactica (new series) with screen-used Nixon "Dork" watch inserted . The watch is expensive so we made a mold for casting resin pieces that look just as metallic when finished. A good example of a "master" or "original' piece that can be molded.

## Supplies

- Douglas and Sturgess
  730 Bryant St.
  San Francisco, CA 94107
  1-888-ART-STUF
- The Compleat Sculptor
  90 Vandam St.
  NY, NY. 10013
  800-9-SCULPT
  212-243-6074
- Johnson Atelier
  50 Princeton-Hightstown Road, Suite L
  Princeton NJ 08550
  800-732-7203
- Perma-Flex
  614-252-8035 orders
  614-252-8034- technical information
- Polytek Development Corp.
  55 Hilton Street, Dept. INT
  Easton, PA 18042
  610-559-8620
- Smooth-On Inc.
  2000 St John St.
  Easton, PA 18042
  800-762-0744
- Silicones Inc
  High Point NC
  910-886-5018
- TAP Plastics
  800-245-5055

## Some Sources of Steaminess

- Tom Banwell
  Leather and resin projects, including Steampunk, masks, helmets, rayguns
- Christina Hill:
  Metal and cast resin jewelry maker.
- The Pink Hare
  Cast resin brooches and other jewelry
- Slippery Brick
  Steampunk accessories, rayguns, helmets, goggles, keyboards, etc.

## Acknowledgments

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***Tracy Newby*** *is a Sci-Fi and historical costumer who wears many hats... and helmets:501st Stormtrooper Legion, Battlestar Galactia, Firefly and Star Trek. Having learned from professional prop makers in L.A., he is always happy to pass on what he has absorbed from studying at the feet of the masters. Vacuum forming, mold making, resin casting, fiberglassing and machining of steel, aluminum and plastic and you have some great hardware. He can also work with "software."*

***Stacy Meyn's*** *"day job" involves instruction about aviation security and explosives detection, and she is more than halfway through her Master's in Education. Costuming and prop building are welcome alternatives. Herd electrons to stacymeyn@yahoo.com.*