



Everything you need to get started sand casting in one list!

Equipment You Will Need:

Sand and Flask Kit

You need casting sand and a flask to hold it. This is a great small kit you can buy to start making small castings. Once you get comfortable using it, you can build a larger flask to your own requirements from wood.

The red sand is Petrobond, an oil bonded casting sand. It works great and doesn't require moisture management. Burned petrobond can be separated out and reconstituted later.

Flask: https://s.click.aliexpress.com/e/_c2JeKRSr
Sand: <https://www.amazon.com/Petrobond-Ultra-Fine-Alternaitve-Replicating-Detailed/dp/B00XRRQ8WC?tag=mio086-20>



https://s.click.aliexpress.com/e/_c4MhmDYF

Riddle: Metal Kitchen Strainer

You need to pass the sticky sand through a sieve to break up the chunks. No need for a special tool here. You can scavenge one from the kitchen, but you should probably get a dedicated one for sand:

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Parting powder

Parting powder prevents Petrobond sand from sticking to things. This 2lb of actual foundry parting powder should last you for **years** of home sand casting.

<https://www.amazon.com/dp/B07S2LDH8G?tag=mio086-20>



Dross scooper (long stainless spoon)

Molten metal often has a film of contaminants and oxides on top that must be skimmed off before pouring. A long stainless steel spoon can help you do that. This spoon is small, and able to get into the bottom of the crucibles used in the starter furnace linked below, but for larger crucibles you can use larger scoopers.

Pre-heat the spoon to drive away any moisture and to prevent molten metal from freezing onto the spoon permanently, and keep leather gloves on and keep your hands far enough away to prevent burns!

https://s.click.aliexpress.com/e/_c32sXI3Z



Graphite Ingot Mold

Often you will melt extra metal, and it can't be left in the crucible. Graphite ingot molds are great. They don't contaminate the metal, and the ingots fall out once cool. This one produces small ingots that will fit into the smaller crucible that comes with the furnace listed below, but many variations exist. You can also weld your own up out of steel, but graphite produces cleaner ingots.

<https://www.amazon.com/Graphite-Refining-Aluminum-7-09x2-17x1-77inch-3000gGold/dp/B07V6K871W?tag=mio086-20> (often out of stock)

https://s.click.aliexpress.com/e/_c3gLt9IN

<https://www.amazon.com/dp/B09PK43K1W?tag=mio086-20> alternative 1

<https://www.amazon.com/OTOOLWORLD-Graphite-Crucible-Melting-Refining/dp/B071Z26C32?tag=mio086-20> alternate 2

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Furnace Kit

To melt the metal, you can get electric or gas furnaces. Both can be found in complete kits with crucibles, gloves, and tongs. Both have advantages. Electric set ups are easy to use and can give you very precise temperatures, but aren't as large as propane furnaces and you don't want to melt down lots of scrap with an electric furnace.

To start with, I would suggest using clean casting metal linked below (Za12 is the way to go unless you have a burning desire for bronze), and an electric furnace kit like this one. Easy temperature control, and no open flames. 2 Crucible sizes up to 3kg, leather gloves, and tongs. You just need a place to plug it in.

The electric furnaces come from many suppliers. Make sure it includes a 1kg AND 3kg crucible, tongs, and gloves. Also make sure it can heat to 1150C if you intend to cast bronze, gold, or silver alloys.

2 small Electric Furnaces:

[Vevor Website](#)

https://s.click.aliexpress.com/e/_c32plaf5 If you intend to cast LARGE objects, Vevor has released a [5KG model](#)

OR, you have the option to go with **propane**:



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Propane Gas Furnace

Propane melting furnaces require a gas tank, more space, and extra care to operate, but can allow you to melt larger amounts of metal more quickly. Be careful to get a high quality crucible to avoid breakage, and be aware these do use gas, emit more fumes, and are more difficult to control.

Pictured is the **Devil Forge brand furnace. I have **NO** experience with Devil Forge products, but I know several people who do, and I hear good things. Avoid cheaper gas setups, and ones with exposed ceramic wool.

[Devil Forge Website](https://www.amazon.com/DEVIL-FORGE-Propane-Furnace-FB1Sb-Full/dp/B0B3BRJ2JS?tag=mio06-21)

[https://www.amazon.com/DEVIL-FORGE-](https://www.amazon.com/DEVIL-FORGE-Propane-Furnace-FB1Sb-Full/dp/B0B3BRJ2JS?tag=mio06-21)

[Propane-Furnace-FB1Sb-Full/dp/B0B3BRJ2JS?tag=mio06-21](https://www.amazon.com/DEVIL-FORGE-Propane-Furnace-FB1Sb-Full/dp/B0B3BRJ2JS?tag=mio06-21)

Crucibles

Safe crucibles are a must, and I get my gas furnace crucibles from PMC supplies. They have a website, but the prices are better from their Amazon store:

<https://amzn.to/416MgK8>

And be sure to use proper sized tongs! Grabbing a crucible with channel locks can and will damage the crucible and can cause injuries!



Metal Sources!

Different metals can be found at different suppliers. Belmont, RioGrande, and Rotometals are all places I have purchased metals from and will continue to do so. Make sure the metals come in a form that will fit into your crucible, or you will have to cut it down. Casting grain and shot will fit in the smallest crucibles, some ingots are very large and require cutting down even for large crucibles. I have purchased metal from the following suppliers, and have had good experiences with all of them:

<https://www.RioGrande.com>

www.Belmontmetals.com

www.Rotometals.com

You can also scavenge metals, but make sure it's clean, and you get an alloy that is right for casting! Cast aluminum car parts (a356) are a good place to start, but require cutting down to fit in a crucible. Avoid cans and extrusions.

Metals I recommend for getting started:

Ancient Bronze:

The original casting alloy. 90% Copper and 10% Tin by weight. In grain form, is perfect for an electric furnace, but can also be melted easily in a gas furnace. Perfect for Jewelry, bronze age recreations, patinated works of art. Flows well but requires high heat, and wears out the electric furnace elements faster

[5lbs Bronze from Pepetools](#)

[5lbs Ancient Bronze Casting Grain, Rio Grande](#)



Za-12

Za-12 is an alloy of Zinc and Aluminum used in sand casting and die casting. It melts at a low temperature and flows very nicely. There is one source for 1lb ingots small enough to fit into the 3kg electric furnace crucibles: Rotometals.

In the photo to the left, the spears are ancient bronze (on left), Za-12 (middle), and a painted 3d printed pattern (right).

[Za-12 Small Ingot value pack](#)

Printable tools!



Sand rammer

This is a tool you can use to ram the sand while making molds. It's also a split pattern, so you can cast one in metal. Attach the 2 sides with 1/4" dowels or copper pipe, like in the photo. Download the file, print 2 copies (the 2 halves), add the dowels, stick them together, and you're ready to go. Find the file free at [Sand Rammer- Usable tool AND pattern](#)

Can be FDM printed without support material. The print can be used as a casting pattern, shown on the left next to an aluminum casting

Rapping tool

This is a tool to help you remove patterns from sand while mold making. It isn't a requirement, but I do have a free file for one you can print, so why not?

[Printable Rapper Tool](#)



Gating Tools for mold making

These tools really need to be designed to fit the flask you are using, but they are quick to design and print. They save you time when making the gating system in the mold and help you make consistent, high quality prints.

There is no limit to what kinds of gating you can make. No need to cut gates. You can even print gates and patterns in place and use them together!

No files available for these as they are flask-specific

Patterns

No need to make wooden patterns. If you can print it, you can cast it, as long as you follow pattern making rules. Almost every casting I have done in the last few years has been from a printed pattern. No need to learn woodworking!

Hammers, spears, signs, rings, everything is possible. If you can sand cast it from a wooden pattern, you can print that pattern instead! Pictured here is a printed pattern next to a patinated bronze casting



The following can be found around the house, or at a hardware store

2 socks NO HOLES! Yes, really. Fill one sock with some of the parting powder from above, and put that sock inside the other sock. You use it by shaking it above the pattern and sand to dust it with parting powder.

Makeup Brush can be used with the parting powder to brush it around the part. Use the sock above to dust the powder liberally, use the brush to move around any piles and get the parting powder anywhere that dusting may have missed.

Strike tool

This is used to shave off the extra sand on the top of the flask when you are mold making. No need to be fancy here. A metal ruler or in this case a piece of angle iron will work fine.

Can't find any angle iron? Grab a solid ruler. As long as it's longer than the flask is wide, you are good to go.





Vent Wire

Yes, just a wire. That is a piece of TIG welding filler rod. If you don't have any of that, straighten out a wire coat hanger.

This is used to put vent holes in the sand, allowing air to escape when you pour metal into the mold. With petrobond sand, you can often get away without doing this at all.

You can use this in conjunction with a gating system that allows air to escape, but sometimes venting with a wire is it takes to get a successful casting

Patterns to cast!

Maker Coin

This is the file used in the video. I printed this on a Prusa MK2, but any FDM printer will do. Resin will work as well, A supported version is also included.

[Printable Maker Coin File](#)



Quick Tips!

- 1:** Use the right metal. If you aren't purchasing metal but instead want to scavenge scrap, make sure it's from a part that was already cast. That's how you know it's the right alloy
- 2:** Wear safety gear! Leather is best, natural fibers are next. Cotton/denim and wool. DO NOT wear polyester, nylon blends, or any other artificial fabrics. Nylon can melt onto your skin, leather doesn't melt. Welding clothes work perfectly for this.
- 3:** Don't forget **PARTING POWDER!!** Your sand flasks can't stick together, and the pattern can't stick to the sand. If they do, you can't get the pattern out.
- 4:** Ram the sand hard enough! You aren't going to break it. It's sand. If you do mess it up, you can knock the sand out and start again as many times as you need.

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5: Don't forget to connect the gating (the copper pipe in the video) to the hole left by the pattern. In the video, I formed that "in-gate" with a pencil. I have forgotten this step before, and it results in a perfect metal casting...of the gating, just not the part.

The Next Steps!

If you're excited to start pouring metal but still unsure how to use everything in this guide — I've got you covered.

Inside the **Maker's Metal Casting Masterclass**, I'll walk you step-by-step through every stage of the process — from your first simple pour to making pro-level castings. It's designed to help you build skill and confidence fast, without feeling overwhelmed.



I'll be there to guide you, answer questions, and help you get results.

[Join the Maker's Metal Casting Masterclass](#)

Can't wait to see what you make,
– Paul