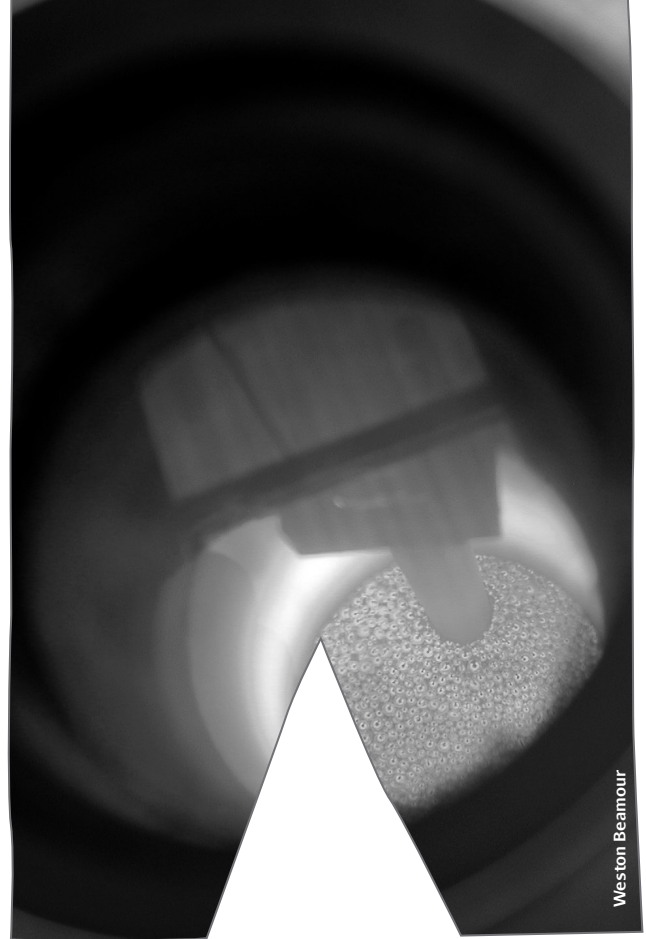


# Fact Sheet 06: lost wax casting



Weston Beamour

## Introduction to lost wax casting

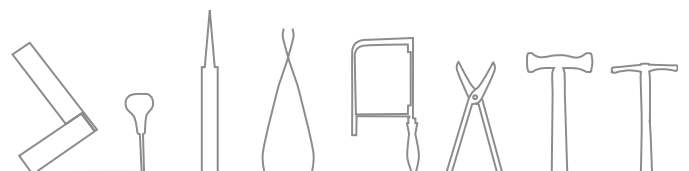
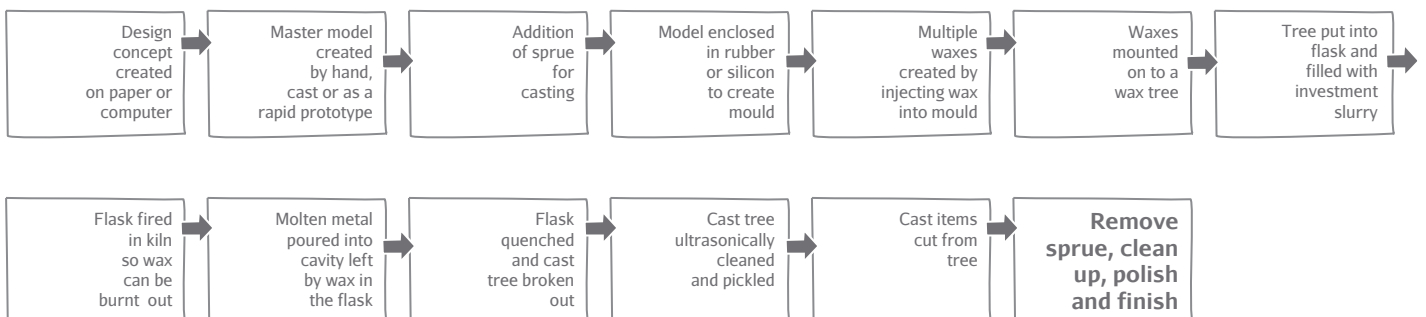
Lost wax casting is the most common type of casting used in the jewellery industry for production. Casting gives the jeweller or silversmith the ability to produce repeat patterns over and over again, which can substantially save on time and labour costs.

Silver and gold alloys are generally vacuum cast, while platinum and palladium use centrifugal casting which requires higher temperatures, is a more difficult process and therefore can be more expensive.

## Preparing your design for casting

To begin with you need to make a suitable model either in metal or in modelling wax. Modelling wax can be bought at most reputable tool shops or ordered on line and comes in block, sheet, tube or rod form. At this stage you could also outsource the making of the model to a professional **master pattern maker** or **wax carver**.

Remember that the model needs to be as perfect as you can get it because any imperfections at this stage will be replicated in each casting you produce. In creating your model, consideration needs to be given to the final weight of the item and therefore you should avoid any unnecessary thickness in the metal while also paying attention to not making areas too thin either - for example claw thicknesses. If you are planning to use stones in the resulting piece, these should also be planned out in advance.



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## A word on shrinkage

Due to shrinkage on solidification, and the polishing and finishing process, your final casting will be slightly smaller by about 1-3% so you need to allow for this in your master pattern. And remember, if you make a wax model and cast a metal master pattern from that, you need to allow for shrinkage to occur twice. Knowledge of shrinkage is information picked up through experience as models don't necessarily shrink uniformly. Remember that it is always easier to take metal away than to have to add it later so erring on the side of caution is advisable. For example, for a ring, you could make it slightly smaller so you can size it once it comes back from casting if the design lends itself to doing that.

Again, a master model maker or wax model maker will have in-depth practical knowledge of this process and can advise you. You can also liaise with your casting company who should be able to estimate likely shrinkage based on your design.

## Sprues

Most casting houses can add sprues to your wax masters for you and if you have little experience in this area, it is probably a good idea to let them do it for you as they understand how metal flows and fills the mould. However, if you send a metal master pattern with no sprue, bear in mind in this case there will usually be a cost involved.

## Approaching a casting company

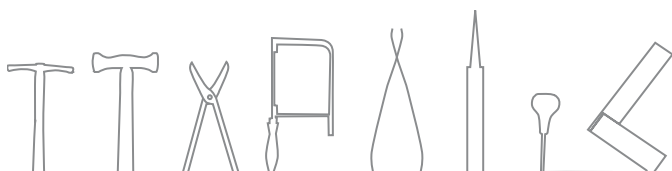
Casting companies now accept models in many forms, including wax models, rapid prototypes, metal master patterns, or even a small plastic component or other natural object that can be cold moulded. Many can now create **rapid prototyped** models for you from your **CAD** design. And many casting companies now offer a complete jewellery manufacturing service where you can end up with a finished and polished piece at the end of the process. It all comes down to which aspect of the processes you want to outwork or do yourself and obviously cost.

When you send your work in to the casting company, make sure that you stipulate the following:

- \* If you have sent a hand carved model, state whether you want the item to be cast directly or whether they should make a mould of it first. This is important as if they cast it directly, you will lose the wax model in the process.
- \* In which metal would you like the piece to be cast? For example, if you want it made in platinum, be aware that there are different alloys of platinum and that you should research their suitability for the piece you are making. See **Fact Sheet 01: getting your work made** regarding choosing the correct alloy for your work.
- \* How many pieces you would like produced
- \* The correct shipping address and your contact details clearly marked on your **purchase order**.

Other things to note are that you should always ask for an estimated cost prior to giving the go ahead – fluctuating precious metal prices could give you a surprise and if the cost is too high you still have time to modify the model so it uses less precious material.

As with all outworkers, check on lead times at every stage in the production process. More information about dealing with manufacturers can be found on **Fact Sheet 02: approaching a manufacturer**.



## Cleaning up your castings

When you get your castings back from the casting company, you should first check them for any porosity. There may be slight surface porosity in some of your castings but this should easily be filed off, it is rare to find castings with no porosity at all. Anything greater than that, you may need to consult your casting company and discuss recasting, although most of this should be dealt with during the company's quality control checks.

You will usually receive back your castings bead blasted, which takes off any investment baked and also leaves them with a uniform clean finish.

Once you are happy with the quality of your castings you need to remove the sprue. You can do this quickly by cutting it off with cutters or if necessary, a piercing saw.

Keep all sprues and scrap clearly labelled by alloy so you can reuse or reclaim the scrap value later. You can then go on to finishing and polishing your pieces in the usual way with emery and polishing compounds.

Some companies employ outworkers to clean up castings if they have lots of them, so this is a consideration if you would prefer not to undertake that aspect of your production. You may also find your casting company offers this as a service.

## Costing and pricing

When getting your work cast from a wax, there are usually two charges per casting – the cost for the metal and a casting charge (also sometimes referred to as a fashioning charge), plus VAT plus a shipping charge. Some casting companies offer discounts for multiples so it is worth checking this in advance of your order.

Silver and gold alloys are generally vacuum cast, while platinum and palladium use centrifugal casting which requires higher temperatures, is a more difficult process and therefore more expensive.

If you send a metal master pattern and require it to be moulded, there will be a moulding charge. Bear in mind that the mould belongs to the casting company and is regarded as part of its tooling. Only you will be able to order from that mould and you will retain the IP of the design but ownership generally lies with the casting company.

## Casting FAQ

**Q: Will the casting company own and retain my mould?**

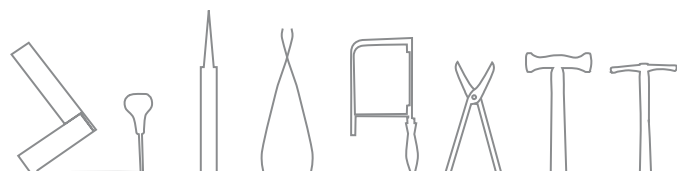
A: Yes, the casting company owns and retains the mould

**Q: Do casters offer FairTrade and Fair Mined metal that I can use for my castings?**

A: This is a hot topic in the jewellery industry and at the time of writing there are only a couple of casters that offer this service although it is hoped this will increase in the future. At present it is only offered in 18ct gold and to those companies and designers who have also received certification from the Fairtrade Foundation to manufacture in the metal<sup>1</sup>.

*“Simplifying the design and production of the product made the transition to manufacturing possible as well as ensuring that the communication of detailed specifications and instructions for manufacturing production is clear.”*

<sup>1</sup> [www.westonbeamor.com](http://www.westonbeamor.com)



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## Glossary

### **Sprue**

The passage through which molten metal is introduced into the mould to form a cast piece

### **Casting**

Manufacturing method by which molten metal is poured into a mould and allowed to solidify to form a component piece of jewellery

### **Flask**

Tooling to hold a mould for metal casting

### **Rubber mould**

Hollow rubber mould that contains a cavity mould in the shape of the master pattern. Wax is injected into the mould to create wax patterns

## Databases of industry specific trade services

The following websites hold information about trade services, equipment suppliers, products and educational courses:

### **benchpeg: [www.benchpeg.com](http://www.benchpeg.com)**

The jewellery industry's leading creative and digital communications network

### **British Jewellers' Association Trade**

#### **Product Search: [www.bja.org.uk](http://www.bja.org.uk)**

A membership organisation that represents the jewellery industry

### **Ganoksin: [www.ganoksin.com](http://www.ganoksin.com)**

An international online resource for the jewellery industry

### **The Goldsmiths' Company Technical Portal:**

#### **[www.thegoldsmiths.co.uk](http://www.thegoldsmiths.co.uk)**

A supplier database of trade-to-trade services and suppliers

## Acknowledgements

Weston Beamor Ltd

[www.westonbeamor.co.uk](http://www.westonbeamor.co.uk)

