

Basics; - Lost Wax Casting

Lost wax casting is a very ancient and still very commonly used way of producing jewellery (as well as sculptures and other metal objects) - both for creating one off items, but also very often for multiples.



Wax models are made then encased in plaster (or clay), with a pouring hole created leading to the model. The whole thing is then heated to allow the wax to burn away (the 'lost wax') leaving a hole in the plaster into which molten metal can then be poured. The metal is then cooled and the plaster destroyed so that the individual models can be separated and cleaned.



Wax Models

A wax model can be hand made, carved or modelled from a variety of different casting waxes. Waxes are available with different properties - some are better for carving, some for melting, some for sticking bits together or for hand modelling.



Waxes can also be made by pouring hot wax into a rubber mould - a mould is used to make copies of a metal item, as well as to mass produce identical items from a single original model.

Special equipment is available to create moulds and inject hot wax into them - the wax is removed and then the mould can be reused to make many identical waxes for casting.



Waxes can also be created by computer controlled milling machines from CAD designs, or printed directly using specialist 3D printers.

For most jewellers - this is where you would hand the wax to a casting specialist who can use specialist equipment to ensure the model is cast successfully with no faults.

Sprues

To be able to cast the completed wax - it must have at least one sprue attached - a sprue is a wax wire used to create a path for the metal to reach the model. For complex and larger pieces, multiple sprues will be needed to make sure that the metal can reach and fill the whole area before it starts to cool and set.

The sprued piece/s are built onto a special wax 'tree' - each wax



creating a new branch. This tree is set into a rubber base that is specially made to fit the casting canister.

Investing in Plaster

Special investment plaster (this has a particularly fine texture to ensure that all the detail in your model will be retained - as well as being resistant to the heat of the kiln) is mixed and carefully poured into the cans to cover the wax tree. It is then placed in a vacuum chamber to remove any air bubbles before the plaster is left to set. The plaster can is then put in a kiln to burn out the wax leaving a hole for the metal - where the 'lost wax' process comes from.



Casting

The plaster can is now ready for the molten metal. The metal can be melted in a crucible and poured by hand into the plaster, but for better results, a casting machine is needed. A simple casting machine has a special spring loaded crucible attached to the plaster can, which when released will spin and fling the metal into the mould using centrifugal force. Specialists will have advanced versions to enable more reliable casting.



Cleaning Up

Once the piece is cast and cooled, it is immersed in water to soak the plaster away to reveal the metal 'tree'. All plaster residue is carefully washed or scrubbed away, then the individual models cut from the tree. This is the point where it would usually return from the casting specialist to the jeweller. The jeweller can now use a piercing saw to cut off the remains of the sprue then a variety of files or burrs and papers to smooth and polish the surface. The metal tree and sprues can be recycled.



More Info

This process is possible in a small workshop if you invest in the appropriate equipment, but this is expensive and the equipment can be dangerous and give unpredictable results. Most small jewellers therefore use a casting service.

There are many specialist companies that are able to cast in many different metals, from one or two models, to many hundreds. They will also be able to create rubber moulds and make waxes for you from a metal or other model if needed.



JewelCast - www.jewelcast.co.uk -

Quality Casting UK - www.quality-castings.co.uk, Hackney

West One Castings - 24 Hatton Garden - AA Casting - www.aafinecastings.co.uk, Holloway