

ASHANTI CASTING TECHNOLOGY



Picture on title page: silver bracelet, AG925

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The procedure is called lost-wax casting or fonte à cire perdue, and goes back about 6,000 years. With the help of the sophisticated Ashanti technology from Ghana it is possible to create highly expressive, even very thin-walled objects with very delicate designs. Each piece is unique, and requires a laborious manual process in which wax, clay, charcoal and horse manure is formed, fired and cast.

The following pages contain an illustrated description of how the Ashanti casting technology is used to produce a bracelet.

PRODUCING THE CORE



The basic shape of the bracelet (core) is pre-formed from a mixture of fireproof clay and chamotte, which is dried and then fired in charcoal embers. Then this core is refined to its final shape using a filing and grinding process.



APPLYING WAX & WEIGHING

The ready-formed core is heated with a spirit lamp and its surface is saturated with beeswax. Then it is weighed in order to calculate the weight of the metal required for casting.



WAX MODEL



Now the core is completely covered with thin wax platelets. After that, wax sprues are attached by soldering and then joined together to form one somewhat thicker wax sprue.



CHARCOAL CLAY LAYER

The wax model is brush-coated three times with a slurry consisting of charcoal powder and fire-proof clay, with a drying period after each coat.



BUILDING UP A CLOAK



Now the fragile structure is carefully – and in stages – coated with a supporting cloak consisting of fire-proof clay, chamotte and some horse dung. A crucible is formed at the end of the central wax sprue, from which the wax will later flow. The casting mould is dried after each work process.



MELTING THE WAX AWAY

The wax model contained in this structure is now ready for „losing“ the wax. With the crucible facing downwards, the casting mould is slowly heated in the charcoal embers until the wax starts running out and burns with a smoky flame. Now the original form – the wax model – has been lost and the mould is hollow, ready to receive the molten metal.



FILLING IN THE METAL



The quantity of metal required for the casting is calculated using the specific weight of wax and metal; it is then weighed and filled in to the crucible in the form of broken pieces or wire. A suitable crucible cover has been prepared and is ready to close the mould. Finally, the entire casting mould is coated with a further mixture of clay identical to that used in the cloaking process.



CASTING

The melting furnace, which is fired with charcoal, is now ready. The combustion air is blown in at the bottom of the furnace using bellows. The casting moulds are placed in the pre-heated furnace with the crucible end – where the metal is – placed on the bed of embers; the mould is then covered with more charcoal.

Firing the furnace continues until the glowing embers reach the top. The process involves alternate turns of stoking and refuelling with charcoal until the metal has melted.

The red-hot casting mould is lifted out of the furnace using tongs and then immediately turned over so that the liquid metal can flow into the hollow mould.



BREAKING OPEN THE CASTING MOULD

After rapid cooling of the mould in the open air, the clay cloak of the casting mould is carefully split and the bracelet is revealed step by step. The core is removed through the spaces between the spiral windings.



FINISHING WORK

Finally, the casting sprues are sawn off and any remains are filed and ground down. The dark layer of oxide is removed by repeatedly annealing the bracelet and then boiling it in citric acid and alum. After each time it is boiled, the bracelet is brushed with a brass brush and soap until it is clear and, finally, the piece of jewellery captivates the eye.

Producing the bracelet requires an entire week's work.



FORMULATIONS

Designations:

PW = parts by weight

PV = parts by volume

Compound for core

(10 PW of stoneware chamotte, particle size 0-0.2 mm + 2 PW of bentonite) + 0.5 PV of charcoal powder

The basic ingredients are mixed and, after adding water, are kneaded into a malleable compound. When a little methylated spirit is added to the charcoal powder, it is easier to mix with water. The compound is left to stand for a day before use.

Before processing, the roughly formed core is fired hard for 10 minutes in the red-hot charcoal fire.

FORMULATIONS

Slurry for coating the wax models with 3 layers

(10 PW of stoneware chamotte, particle size 0-0.2 mm + 1 PW of bentonite) + 1 PV of charcoal powder

The basic ingredients are mixed and then stirred with water until the mixture turns into a paste that can be brushed on. When a little methylated spirit is added to the charcoal powder, it is easier to mix with water. The slurry is left to stand for a day before use.

Compound for coating the casting models

(10 PW of stoneware chamotte, particle size 0-0.5 mm + 1 PW of bentonite) + approx. 2 handfuls of horse manure for each 5 kg of basic compound

The basic ingredients are mixed and, after adding water, are kneaded into a malleable compound. The compound is left to stand for a day before use.



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