Design Resource

Aranmula Kannadi - Kerala

Metal Mirror Handicrafts

by
Prof. Bibhudutta Baral and Amulya S.
NID, Bengaluru

Source:
https://dsource.in/resource/aranmula-kannadi-kerala

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Introduction

Aranmula Kannadi is one of the authentic and traditional handmade metal crafts of Kerala. There is a story behind the origin of the craft. A few centuries ago from the orders of the king Sri. Anizham Thirunal Marthanda Varma of Travancore, a group of Vishwa Brahmana families (bronze craftsmen) migrated to Aranmula from Sankarakoil, Thiruvallur, Tamil Nadu for purpose of making ornaments and temple articles for Parthasarathy temple. According to a mythological story Lord Parthasarathy (Lord Krishna) in dreams of a widow, Smt Parvathy Ammal comes and reveals the secret combination of the copper and high percentage tin in the right proportions in making the reflective crystal and shinning metal mirror. The craftsmen happened to make a crown for the king out of the same metal proportion who in return applauded and ordered the craftsmen in making the Valkannadi (mirrors) which is one of the articles of Astamangalya sets. Astamangalya sets are the eight auspicious, propitious and fortunate articles used while performing homage and tantric worship in the shrines in Hinduism. These mirrors are also used by the brides of Nambudiri and Nair of Kerala. Various structures in history also carry the sculpture panels and friezes depicting the different figurines holding such mirrors like Madanika gazing at the mirror which resembles the presently thick wooden polishing mount at Belur temple of the Hoysala dynasty in Karnataka. Apart from the mirror, there are many authentic articles made out of the same metal alloys like gongs, cymbals, coinage, wrought vessels, musical instruments and other articles.

This craft has been popular and universally acclaimed. It has been marked under Geographical Identification (GI) in the year 2004-05 in Aranmula. Presently there are around nineteen craftsmen working on this traditional patented craft. This handcrafted and authentic mirror is kept for display at many museums like The British Museum in London which has 45 centimeter tall metal mirror. There are a few characteristics to identify Aranmula Kannadi (mirror), the reflection obtained on the mirror is possessed on the upper surface, whereas in a glass mirror the reflection is in the bottom layer, thus there is no gap between the mirror and the object when it is touched on the surface. Aranmula was the place where the ornaments of Lord Ayyappa at Sabarimala are preserved. Aranmula is one of the renowned pilgrim center of South India, in Kozhencherry taluk of Pathanamthitta district in Kerala. It is also known for authentic celebrations like the snake boat race on the holy River Pampa called Aranmula Vallamkali which is celebrated on Uthirattathi Day of the Malayalam month of chingam, to mark the culmination of Kerala's National Festival, Onam.

Mr. K.A. Selvaraj Achari from Aranmula is one of the artisans who has followed successfully his ancestral and traditional craft to new heights from the age of fourteen. The original form of manufacturing the mirror is possessed by this one household of master craftsmen. Mr. K.A. Selvaraj Achari is guided and worked along with his elder brother Mr. K.A. Gopalakrishnan Achari, who preserves in giving the lustrous final polishing of the mirror. The two brothers learnt the secret of making these mirrors from their father Mr. V.K. Arjunan Achari and grandfather Mr. N. Krishnan Achari. Mr. K.A. Selvaraj Achari holds the president post in "The Vishwa Brahmana Aranmula Metal Mirror Nirman Society" made for metal mirror manufacturers of Aranmula.

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Mr K.A. Selvaraj Achari also owns their family store "Parthasarathy Handicrafts Centre" which is situated in Aranmula and his workshop is just above the stores. The artisan says that the sale of the mirror gained popularity after it received a GI certification. The mirrors they have produced are cent percent pure and handcrafted. The mirrors are also marked with a Hologram trademark. Many big personalities like Kapil Dev, Sachin Tendulkar, and former president APJ Abdul Kalam have received the traditional mirrors as a memento on different occasions in Kerala. Aranmula Kannadi is also declared as an official memento to be presented by the government of Kerala.

Artisan engrossed in making of Aranmula Kannadi.

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Metal fixed to the wooden slabs are kept in order for drying.

Artisan of Aranmula Kannadi from Kerala speaking about the making of the craft.

Mirror is being fixed to the metal frame using glue.

Artists at Aranmula village engaged in making of Aranmula Kannadi.

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Tools and Raw Materials

Tools and raw materials that are used for Aranmula kannadi:

- Clay is used in making the mould for the metal casting.
- Baked clay slabs are used as a base for the mould building.
- Copper and Tin are the two important alloys used in making the metal mirror.
- Coal is used for firing in the furnace and also as a softening agent to get a smooth finish of the mirror.
- Coconut coir is used in the furnace for firing the mould and in melting the metal.
- Beeswax is used in making the channel in mould for easy casting.
- Furnace is used to melting the metal and baking the clay.
- Wooden slab with a handle is used as a holder for the metal mirror in the process of polishing.
- Emery paper is one of the initial polishing apparatuses of the mirror.
- Velvet cloth is used in the process of polishing.
- Soft cotton cloth is used in the process of final polishing.
- Chisels are used in engraving and embellishing the brass mirror frame.
- Hack saw blade is used in cutting and shaping the mirror.
- Grinding machine is used in buffing and grinding the brass mirror frame.
- Foundry moulding boxes are used in box moulding the brass metal frame.
- Hammer is used in hitting the chisels.
- Stone platform is used as the base in the process of grinding the mud.

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- Coconut oil is used in polishing the mirror.
- Water is used in multiple processes while making the mirror.
- Adhesive is used in sticking the mirror to the frame.
- Brass ring is used in sealing the mirror to the frame.

Clay is the key material used for preparing the clay mould for metal casting.

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Hollow frames used for baking the clay slabs.

Chisels of different designs used for embellishing the brass mirror frame.

Compass is used for maintaining the precise radius.

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Tong is used holding/lifting the crucible from the furnace.

Hammer is used for hitting the chisels and fixing the metal mirror to the frame.

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Sharp pointed tools used for designing and polishing purpose.

Metal frame is the one, which acts like a holder for metal mirror.

Metal alloy chunks are used for making metal mirror.

Wax is used for creating a channel in mould for easy casting.

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Coal is applied on the dried clay slabs and also used for firing in the furnace.

Metal rings used for sealing the mirror to the frame.

Oil is used for polishing the mirror.

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Electric hand cutting machine used for chopping off the extra metal.

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Making Process

The making of this mirror embeds multiple processes that require lots of patience and persistence. Firstly the metal alloy is prepared of 'tin and copper' and tested for the proper proportion and quality. This metal alloy is a binary copper-tin alloy with 30 -34% of tin, this proportion is closely related to a bronze metal alloy. Later it is broken into small chunks for casting. The mould is prepared with the mud clay from the nearby paddy fields by powdering and refining them. The clay is mixed in proper consistency in order to make two flat surfaces like slabs. Later the slabs are dried under the sun and baked to make them hard. Once the baked mud slabs are ready the coal is applied by rubbing it over its one side surface with water to give it a smooth finish. Two baked mud slabs are covered with a coat of coal on the surface of either side of them. The slabs are placed one onto one, and the coal coated are facing each other. A gap will be made between two slabs with a small piece of wax protruding outside the mould to make an opening for pouring metal and small alloy pieces in order to acquire the required thickness. The baked slabs are packed with the mud clay mixture completely around them which holds the slabs together and seals the openings. The slabs are packed with two to three layers of the clay mixture and small clamps are stuck on three sides of the mould to make the mould strong except for the wax side. The place of the wax is noticed and a cup out of clay is stuck onto the mould and two holes are made inside the cup one on the wax, the other towards the side of the cup for airflow vent. The mould is kept dry under the sun for a day and it is then dusted from the inside of the cup to make the casting easy. The mould looks similar to one of those desert water canteen or a hot water bag. The cup is filled with the metal alloy chunks completely and a wet paper or cloth is covered over the cup in order to avoid dust particles mixing with metal. The clay mixture is packed over the cup and left for drying under the sun. The cup enacts like the crucible. Once the complete mould is dried the casting process begins. The furnace is kept ready for melting the metal by placing the moulds filled with metal inside the furnace, the cup side is downward and the slabs' side is upward. Multiple moulds are placed inside to align with each other and coal is filled to the half upon which the coconut coir is put. The fire is ignited and it is heated to about 745 to 760 degrees Celsius.

The metal inside would have melted and is ready for casting. There are two processes happening at the same time one is melting the metal other one is preheating the mould before casting. Once the required heat is obtained the mould is picked up by the lifting tongs carefully and tilted carefully upside down, so that the molten metal is poured into the mould from the opposite side of the air vent hole. The mould is kept in a place to cool down the temperature. The clay cup and the sealing are broken with the help of a hammer. The slabs are separated and the metal cast is removed carefully. The metal cast is dusted tenderly and consciously. The metal cast is cut into the desired size with the help of a hack saw blade and ruler. After cutting the edges of the metal mirror plate to the required size and form the metal is stuck on a thick rectangular wooden polishing block along with a rear handle with natural adhesive beeswax. The thick rectangular wooden polishing block is made according to the size of the mirrors. The block is embossed by half a centimeter in the middle in a circular form. The wax is placed on the top of the embossed wooden block and a knife is heated to settle the wax flat.

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After the application of wax, the metal is preheated with very little heat and mounted on the wax. Later on, the metal mounted on the block is let to cool down, wax turns harder after the cool down and creates a strong bond between the block and metal. The metal is rubbed and lapped up to a certain time with the consciousness of heat produced by giving gaps between the rubbing processes, letting the metal cool down at regular intervals. The metal has to be at room temperature because the sustainability of heat is less. Thus the artisan keeps three to five mirrors for polishing where each one is rubbed alternatively once its surface turns cool. The metal is then rubbed and polished several times with various materials to attain the mirror appearance. Firstly the metal is scrubbed thoroughly with emery paper and water for debarring, corrosion removal and polishing. The grades of the emery paper reduce gradually when the mirror attains smoothness. After the repetitive process of emery paper lapping for two days. The metal mirror would have acquired a bit of lustrousness and reflectivity. Then the metal mirror is given to the master artisan for more refined work and polishing. The master artisan rubs the metal mirror on three different cloth materials to acquire a high-quality reflective surface. The jute cloth, velvet cloth and soft cotton cloth are used in the process of polishing. Firstly the mirror is oiled on top, with coconut oil and rubbed over the soft jute cloth, then it is oiled again and rubbed over the velvet cloth finally it is oiled and rubbed over the soft cotton cloth. Final lapping is done with finely crushed red oxide (hematite). Red oxide is also used in cleaning the mirror when it tarnishes. After several turns of the lapping process, the metal mirror acquires the characteristics of the mirror. The mirror is then detached from the block by melting the wax. The mirror is then fitted to the frame accordingly with the support of the wax or the brass ring. To avoid the tarnishing of the mirror, it has to be polished with red oxide or vermilion occasionally and to eradicate the grease on the mirror the solidified coconut oil has to be rubbed over. The mirror is supposed to be polished in a vertical motion.

The brass mirror frame is made through the box casting process. The frames are made in very interesting different themes and designs. The designs depend on the customary willingness. Firstly the frame is made in wax or a thick maida paste. The article made is dried and kept. The box moulds are taken and a fine clay mud mixture is made, then filled onto the first box tightly. Later the article made is taken and placed in the right place as well as pressed tightly so that half of the article's impression is acquired. The box frame is placed on the top and chalk powder is slightly spread along with the frame in order to bifurcate easily the layers while removing. Later on, the clay mud mixture is taken and filled completely up to the end of the second box frame and pressed with a wooden plank. After a certain time, the upper box frame is removed carefully and the impressions are attested. Later the second box frame is taken out and the metal frame article is removed. The artisan attests to the impressions on both the box frames obtained and digs two channels connecting the impression. The channels are made to pour the liquid metal and release the air out. Further, the mould box is put together like previously and join it with the clay around the frames to ensure they are leakproof. In a coal furnace, coal is been burnt to obtain a high amount of heat which helps in melting the brass metal in crucible. With the help of Gas propane and a torch, the furnace is ignited. The artisan ensures that the metal is pure by removing the dust particles with the help of the rake. Once the metal is melted, the artisan picks up the Crucible with the help of the furnace lifting tongs. With the help of the other tongs, the crucible is slanted towards a channel hole to pour the liquid metal into the box mould.

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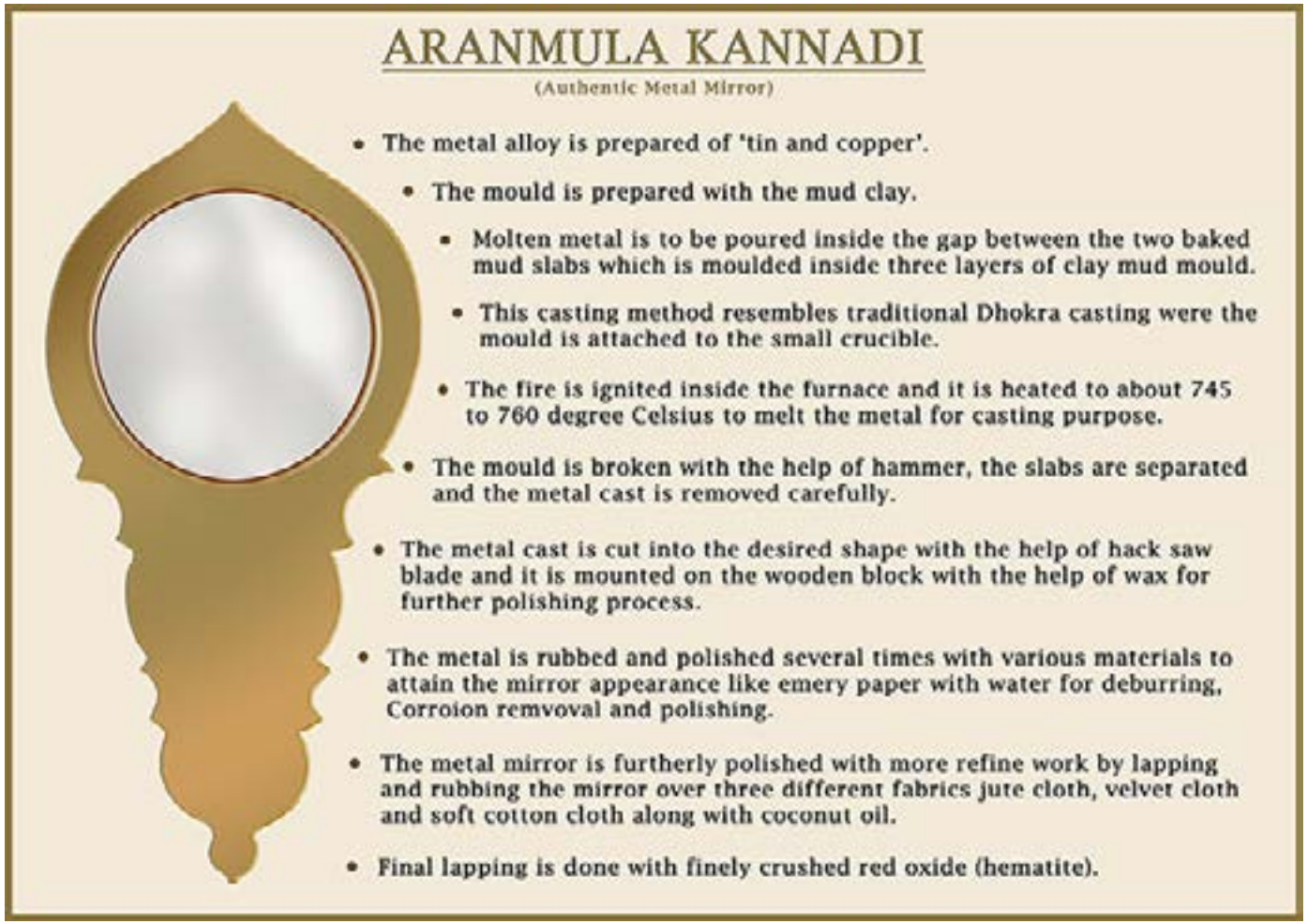
Once the metal flows out from the other channel hole (also called a gate) the artisan stops pouring the metal. After a while artisan ensures with the casted metal, to check with the obtained solidness. Both the box frames are released from the cast. The cast is cooled down by putting it in the water. Artisan removes the channels in the cast by hammering it. The cast is dusted, filled, buffed and final shaping is given by the skilled artisan with various Chisel tools. The cast is washed with dilute nitric acid to get bronze glaze on the frame, which later is washed in tamarind pulp to give a lustrous look and brushed with clean water to get the shinning brass frame.

Flow Chart:



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Required soil is allocated from the paddy fields.

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Fine soil is powdered and refined.

Soil is mixed with water.

And it is kneaded thoroughly for the required consistency.

Clay is further put into hollow frames.

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Leveled flat slabs are made using the frames and then the frames are removed.

These flat slabs are further dried and baked to make it hard.

On one side of the slab, coal is applied.

Small clamps are stuck in three sides and on the top side small piece of wax protruding outside the slab is placed.

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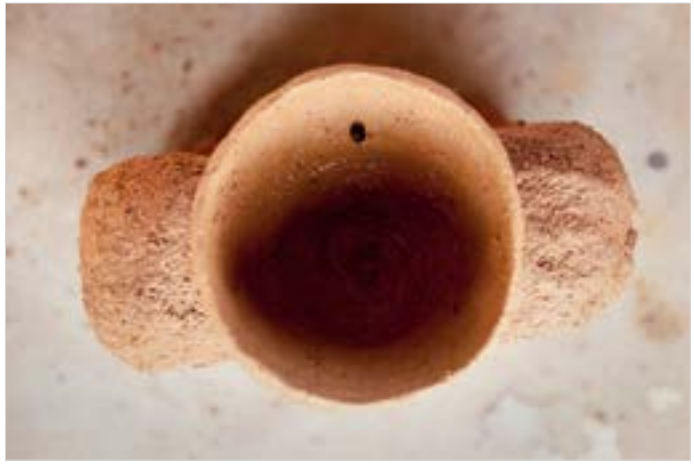
Upon this the other slab is placed and space is made in-between them by the wax piece.

Further these baked slabs are packed with layers of clay.

At the place of the wax a cup made out of clay is stuck onto the clay mould.



Two holes are made.

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Then the mould is allowed to dry.

The clay cup is further filled with metal alloy chunks.

A wet paper or cloth is covered over the clay cup.

Clay is packed over the cup and allowed to dry.

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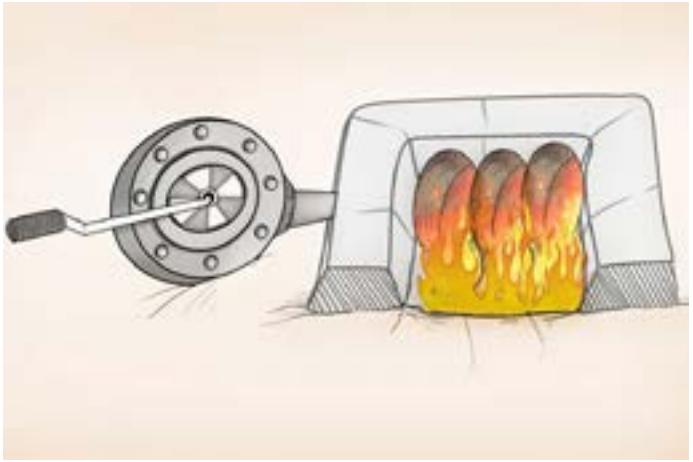

Once the mould is completely dried, it is kept in furnace for casting process.

After the required heat is obtained, mould is taken out from the furnace and the clay cup and sealing are broken.

Slabs are separated and the metal cast is removed carefully.

Metal cast is marked and cut into desired size.

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A knife is heated to melt the wax in the further process.

On a rectangular wooden block wax is spread and melted on it using the heated knife.

After the application of wax, the metal is slightly heated.

Further the heated metal is mounted on the wax.

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Mounted metal is further allowed to cool.

Later the metal is rubbed and polished with various materials to gain the mirror look.

A designer brass mirror frame is chosen.

Minute designs are neatly rendered on the metal frame.

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Brass ring is used for fixing the mirror to the frame.

Further the metal mirror is fixed to the brass frame and hammered.

Mirror is neatly wiped with cloth and cleaned.

Final product is ready.

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Products

The authentic traditional metal mirrors are made as per the order and the requirements of the client. The making of the mirror has inevitably modified as per the trend at present times. The usage of the mirror has changed from being just a mirror to becoming an exclusive memento on an international level. Artisan Mr. K.A. Selvaraj Achari has followed and developed the traditional craft to new heights Artisan has produced many metal mirrors for many big personalities like Sachin Tendulkar (a famous cricketer), Kapil Dev (a legend cricket player) and Dr. APJ Abdul Kalam (a former Indian president). The prices of the complete metal mirror vary from the size of the mirror and the design of the mirror frame, it may cost around INR 800 to INR 100000 lakh.

Metal mirror proposed in an exclusive memento pattern.


Aranmula kannadi designed in conch shape.

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Authentic traditional metal mirror (Aranmula Kannadi).

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Video

Aranmula Kannadi - Part1

Aranmula Kannadi - Part2

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Contact Details

This documentation was done by Prof. Bibhudutta Baral and Amulya S. at NID, Bengaluru.

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