

Design Resource

## Dhokra Metal Casting - Dhenkanal, Orissa

Traditional Craft

by

Prof. Bibhudutta Baral and Rashitha  
NID Campus, Bengaluru

Source:

<http://dsource.in/resource/dhokra-metal-casting-dhenkanal-orissa>



1. Introduction
2. Tools and Raw Materials
3. Making Process
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## Introduction

Metal is a tool that is commonly used for making craft among the tribes of India. Odisha is best known for its Dhokra metal casting which is an important traditional craft. This Dhokra casting is an essentially folk-art that is restricted in few places. People of Sithulias (an aboriginal caste) practice this craft. Other tribes like Ghaniaram, Thatarian and Gharien also practice Dhokra metal cast at Dhenkanal. The metal used for this casting is brass followed by lost wax method. Dhokra metal casting is not only the craft of Orissa but it is also found in Madhya Pradesh, Bengal and Bihar. Especially when it comes to Odisha, Dhokra metal casting is largely set in southwest of Odisha, namely Kuliana in the Mayubhanj district, Kaimatin Keonjhar district, Haradagaria in the Puri district and Sadeibarni in the Dhenkanal district.

Dhenkanal district is an administrative division of Odisha. The district is covered with dense forest that is a home for animals like elephants, tigers and etc. Long range of hills are that acquires major land of this district is a feast for the nature lover. It is basically an agricultural land that provides the principle products of the district are fire-wood, timber, medicinal herbs and plants, bamboo and kendu leaf. The district is also famous for the celebration of Jagar Jatra i.e. Maha Shivaratri festival held during winter season. Since nineteenth century Dhenkanal has also proved that this place is the centre of religious movement, as the movement called “Mahima Dharma” has spread throughout India and Far East countries from then.

Dhenkanal is a Princely state until the independence of India. After the independence the district got merged with Indian Union and subsequently with Odisha in 1948. It is one of the centrally located districts of Odisha. The geographical area of Dhenkanal district is 1,719 sq mi. The land is divided into three natural divisions namely:

- Southern hilly region.
- Northern hilly region and
- The river valley with tributaries.

As Dhenkanal is an agricultural land, the soil of this district is classified into five different varieties. They are:

- Alluvial soil.
- Sandy loam soil.
- Red loam soil.
- Cleaving loan soil and
- Gravelly soil.

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The district is surrounded by Kendujhar towards north, Cuttack towards south, Jaipur towards east and Anugul towards west. Dhenkanal has a long history, which has cluster of temples, a medieval fort and archaeological remains. During 2006 the district was named as Dhenkanal by Ministry of Panchayati Raj. Hindus mostly inhabit this region. The district has many tourist places and also has some large and medium scale industries. As Dhenkanal is one of the country's 250 most backward districts, the craft practiced by the people of aboriginal caste of this region is Dhokra metal casting for their livelihood.

The metallurgical skills with wax technique to create such beautiful Dhokra metal casting technique has also been used by Mohenjodaro craftsman to cast bronze figurine of a "Dancing girl" of 4500 years ago. Using the same technique the tribal families located at Dhenkanal cast the figures of gods and goddesses, lamps, boxes, ornaments and other ritual objects that are used for household needs. These products are sold mainly in local weekly market. The craft of Dhokra metal casting remains a strong link to socio-cultural connections in Odisha. The rural brides of this region also receive a dowry of such metal casted wares.

Dhokra is an alloy of nickel, brass and zinc. When these three are mixed in the appropriate proportion it gives an antique look and augments well with the interiors. The motifs that are mostly used for Dhokra are inspired by folk culture. But in the contemporary world artisans who are still practicing this particular craft also makes other utility items like door knob, ash-tray, pen holder, photo frame, butter box, candle, door handle and incense stick stand.



Metal casting Artisan Sansari Gadatia and his wife.

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Some of the District award received by artisan.



Lord Ganesha idol made for worship.

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Artisan and his son involving in removing the dust particles from the idol.



The Mother statue exquisite beauty of the metal casting.

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## Tools and Raw Materials

The tools and raw materials used for Dhokra metal casting are as follows:

- **Brass:** It is the chief element that is used in Dhokra metal casting.
- **Bees-Wax:** It is the raw substance that is used for making preparing the wax threads.
- **Clay Bees-Wax Threads:** This is wound on the clay model.
- **Coal:** Coal is used in furnace to obtain high amount of heat.
- **Furnace:** To bake the clay model, furnace is used.
- **Hammer:** Clay mould is removed using hammer.
- **Graphite Container:** This container is used for melting the metal.
- **Chisels:** Chisels are used creating impressions.
- **Water:** It is mixed with mud and kneaded thoroughly to acquire necessary consistency.
- **Mud:** Mud is key ingredient used for making the model of the product.



Clay is a basic raw material used to coat over the wax model.

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A raw chunk of wax.



Coal pieces are used in furnace for firing purposes.



Hand held press tools.



The wax is used for the design of the mold.

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## Making Process

A clay mixture of mud, cow dung and water of appropriate ratio is kneaded thoroughly for the required consistency. Using this mixture of clay a core model is made. Upon this model a pure form of clay is applied as a layer for the smooth finishing. This model is allowed to dry completely. By using lengthy wax threads the whole clay model is completely wrapped with it to form a layer and to obtain the selected pattern of design. On this coating of wax layer, a layer of clay with sand is applied. Usually sand is used here for the purpose of tightness in the mixture. Two channels like holes are made on it and allowed to dry. In these two channels, one channel is made to pour the molten metal hence the other channel is automatically used for releasing the air out. After the clay model is completely dried, a layer of sand mixed with minimal amount of clay is applied. Thus the clay-wax model is totally set ready to bake. The model is thoroughly baked in furnace and the wax in-between the layers of clay gets melted and remains as a hollow space between the layers of clay. Further this model is taken out from the furnace and through a channel molten metal is poured into it. This molten metal is initially obtained by melting the metal crucibles in a graphite container. While heating/melting these metal crucibles a bit of salt is added to obtain the pure form of molten metal which also enhances the further process.

The molten metal poured into the clay mold acquires the shape and pattern of the model and acquires the impression of the wax model in fine details. This metal further gets hardened between the layers of upper and inner surfaces of the clay mould. Thus it is dipped in water to cool down the temperature of the metal. Once it is cooled completely then by slightly hammering and brushing the burnt mold, the metal artifact is thoroughly cleaned from both inside and outside. It is further polished all around and sold in market.

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Flow Chart:



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Mold is getting ready by the clay for the basic shape.

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The mold is kept for drying under the sunlight.



Bean leaf are crushed and apply over, which prevent the soil from sticking to the mold.

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After applying over bean leaf, it allows for the drying.

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The wax is shaping into thread with the hand held press.

Wax thread is debt into the water for nonstick.

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The wax is getting wrapped closely on top of the mold.



Intricate designs are made using bee wax.

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The first layer of riverside soil is applied over the mold.



The second layer of the clay using rice husk and cow dung is applied over the mold.



Chamber is again left to dry for a day.



The wax runner is added to the top of the chamber.

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Again it kept for drying.



The metal is kept into the wax runner and cover with the clay.



The chamber is kept in proper way inside the furnace.



Mold placed in such a way absorb a red hot during heating.

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Wax runner is separated from the chamber after the heating process.

Hammer and chisels are used for removing the mold from the metal.



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Removing the dust particles from the metal using the chisels.

Metal product is further taken for polishing process.

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Dhokra metal product of tortoise.

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## Products

The cost of the products depends on the workmanship it has undertaken in preparing it. It also varies in sizes and designs. As these products have an antique appearance it is used in many corporate offices as a showpiece and also used for house decorating purpose. Some of the products that are made using this special technique are: Gods and goddesses.



Elegant brass chariot classically designed.

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Ganesh idol, made of Dhokra metal casting.



A Dhokra brass pot used in decorative purpose.



Traditional diya made of brass.

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Wall hanging and flower pot, for home décor.



Attractive Home décor item made of metal casting.

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## Video



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