

**THE APPLICATION OF PATE DE VERRE TECHNIQUE WITH
CHAMOTTE MUD MOULDS IN MOTHER GODDESS FORMS***Nurettin GÜLAÇTI****Abstract:**

It is known that obsidian glass has existed for 4,5 billion years since the Big Bang. Glass, in the form of inorganic melting product solidifying without crystallized, exists as mostly in the form of obsidian in the nature and it is one of the first tools (such as flint and pebble) that human beings used.

It was scientifically determined that glass was first used by Egyptians in the Nile delta around Alexandria. Glass jewellery known as “Egyptian Beads” and used as jewellery were later turned into both daily goods and sculpture.

Human beings have been in the search of ways of manufacturing glass in historical process and have used and developed many techniques such as mosaic technique invented due to glass furnace in the Antique Age, glassblowing technique, gathering technique, internal mould technique, amalgamation technique and frit (Pate De Verre) technique. It is possible to add “The Chamotte Mud Mould Technique” to these techniques.

In this study, glass statues and other different forms sized 50, 60, 70 cm. and bigger, which are almost impossible to shape with the Pate De Verre technique applied in plaster mould, were more easily shaped with the shaping technique in chamotte mud mould. It was determined that it was easier to apply this method in desired sized when achieving glass works. This technique shows originality since it has first been used in glass statues.

One of the most important features of this study is that the waste glass and bottles that were collected from the environment like picnic sites were converted into ornamental or artistic statues and statuettes and forming new styles / formations by shaping them in in chamotte mud mould.

Key words: Mother Goddess, Glass Shaping, Pate De Verre Mould, Chamotte Mud Mould.

Introduction

In this study, it was thought that it is important to mention Mother Goddess forms found in Anatolia since new designs were created by being inspired from Mother Goddess forms. The source of “Mother Goddess

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Belief” which was widespread in Mediterranean, north countries and central Asia from the past to the monotheistic religions is Anatolia (Erhat, 1997: 183). The archaeological excavations by researches revealed that Mother Goddess figure “dates back 8000-6500 BC in Çatalhöyük and Hacilar” (Uçankuş, 2002: 27). Mother Goddess represents abundance, plenteousness, nature, all living things and fertility. Mother Goddess figures have been depicted and interpreted in different ways in every age.



a.

b.

Photograph 1. Sitting or Standing Mother Goddess Figures

a. Mother Goddess, terra-cotta, 20 cm high, Çatalhöyük, 5750 BC, Anatolian Civilizations Museum.

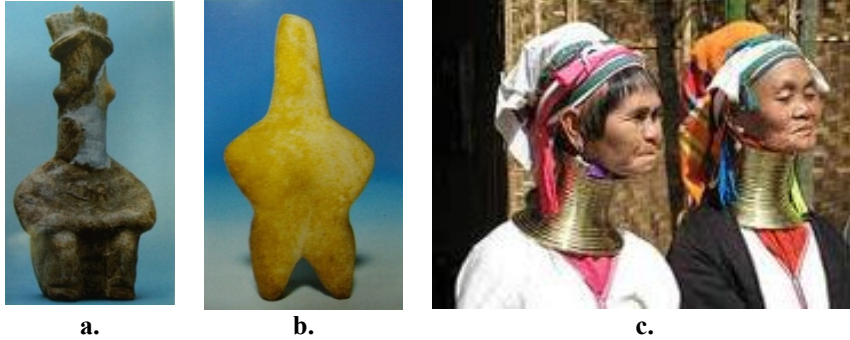
b. Twin Goddess, Marble, 17,2 cm high, Çatalhöyük, the first half of 6000 BC.

In Goddess Figures “Patterns such as fat hip, big breast, fatty paunch, swollen and triangular genital organ are remarkable. The patterns are the same in all Mother Goddess Figures from Kubaba, Kybele to Artemis at the aspect of symbolizing motherhood and femininity (Uçankuş, 2002: 27).

When Metal- Bronze Age (5500-3000 BC) Kybeles are examined, it is seen that the Mother Goddess figurines in this period were made with different materials (stone, soil, marble etc.). Most of the terra-cotta goddess figurines of Chalcolithic period and Neolithic Age are sitting position and schematic (Anadolu Medeniyetleri Müzesi Kataloğu, 1997: 49).

There are some woman figures having long necks among the Mother Goddess figurines of Chalcolithic period. The fact that Some women of native tribes in today’s Africa prolong their necks by wearing iron rings is

also interesting at the aspect of reminding us Chalcolithic period Mother Goddess as an aesthetic thinking.



Photograph 2. Long-Necked Mother Goddess Figures And a Long-Necked African Women

a. Sitting Mother Goddess figurines: terra-cotta. 32,5 cm. high. Canhasan, the first half of 5000 BC, Anatolian Civilizations Museum.

b. Women Figure Statue: Marble. 10 cm. high. Canhasan, the second half of the 5000 BC, Anatolian Civilizations Museum.

c. Long-necked women from today's Africa.

Phrygians, another civilization in Anatolia, believed Mother Goddess "Kybele". Phrygians made Mother Goddess Figures in niches since they made them in rocks. There is a Mother Goddess Kybele statue standing in some of these niches. There are two lion figures, sitting or standing, on both sides of these Goddesses (Uçankuş, 2002: 27-28).

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Photograph 3. Triangle Pediment and Lunate Kybele Relief

In this study, it was aimed to convert Chalcolithic and Phrygian Period Mother Goddess figures found in Anatolia into glass by inspiring them.

Glass Works and Manufacturing Techniques

Description of Glass

“Glass is an inorganic melting product that solidifies without crystallizing after becoming cold” (Sümer, 2007: 1). It is also described as *“the main components, oxides that can be turned into glass (vitrifiers), melters and stabilizer and ancillary components”* (Yıldızay, 2010: 73).

History of Glass

The most natural state of glass is obsidian (natural glass) and it is the most seen material in nature. Obsidian which is a volcanic rock arises from the shaping of quartz by magmatic way. Mountain crystal is called the state of quartz made with metamorphic way. They are natural glasses existing magmatic and metamorphic ways during the formation of earth (Uzuner, 2004: 5). Another glass type is fulgurite that exists as result of falling lightning on sand and glazing of sand.

Glass was first made by Egyptians around Nile delta (Sümer, 2007: 1). The word glass was acquired from an area located in the north-west of the same delta and glass manufacturing was carried out in Alexandria.

In the past ages, most of the glassware was made as jewellery for women. In that period, glass bracelets, claps and necklaces were made consisting of coloured beads. Furthermore, beads were also used for making clothes. *“Today, glass is an indicator of the civilisation level of the societies. It is obvious that the societies using glass are economically more advanced than the other societies”* (Uzuner, 2004: 8).

Glass manufacturing was carried out in Asia, Europe, Mesopotamia, and Middle-east, and it was also made in Anatolia in Ottoman and Seljukian period. In Seljukian period gilded glass was manufactured in Diyarbakır, Harran, Hama and Halep.

19th century was a period in which Turkish glasswork revived. In that period, a glass workshop and factory was founded in Beykoz, Bosporus in İstanbul. *“This century was the period in which Beykoz type glass was produced”* (Bayramoğlu, 1996: 12).

In today’s Turkey, many glass factories have been built and glass art departments have been founded in the related departments of some universities.

Pate de Verre Technique

Pate de Verre, is a French origin word and this technique is described as frit technique in the Turkish resources. Although the basis of slit technique, like many glass techniques, was founded in Mesopotamia, it was

revived towards the end of the 19th century by French glassmakers (Aydın, 2008: 29).



a.

b.

Photograph 4. Glass Samples Produced with Pate de Verre Technique

a. God figurine made by Hittites with mountain crystals in 14th -13th century BC, found in Tarsus.

b. Şahmaran glass trinket manufactured by Bilgehan Uzuner

There are two different application methods in Pate de Verre technique. In the first of these methods, glass pieces are heated and left into water so that the glass is broken into pieces. Or it is broken into pieces with mechanical ways and sifted. Very small pieces are used for various purposes. In the second technique, glass pieces are placed in the plaster moulds, baked and a fused filled surface is obtained after the glass pieces reach the furnace desired temperature. This technique is called as Pate de Verre.

There could be a new and third technique application in Pate de Verre technique in addition to the classical shaping methods. And it is possible to call this technique as Chamotte technique.

In the application before chamotte mud moulds, Pate de Verre technique was tried to be applied by mixing %30 mould and %70 quartz, but the desired result could not be obtained since the mould burst. However, after experimental application and research, by using chamotte mud moulds the desired result was tried to be obtained.

Findings and Comment

One of the most important points in the application of Pate de Verre technique with chamotte mud moulds is the process of the application of dust quartz watered down as separator on the inner surface of chamotte mud mould with a brush so that glass and chamotte do not adhere to each other. During this process, first the form to be made is selected and then it is shaped with ceramic mud.



Photograph 5. Shaping Mother Goddess Figure with Mud

In the second step, the forms shaped with mud are taken into plaster moulds and these forms are turned into mold models.



Photograph 6. The Plaster Models and Moulds of Mother Goddess

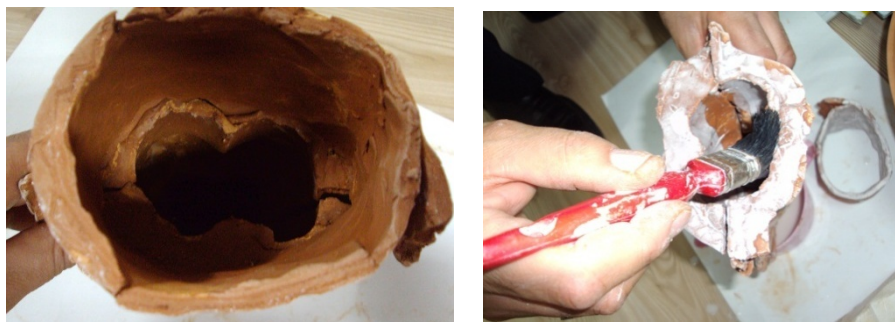
In the third step, talcum powder is unilaterally splashed on the model in plaster mould and the negative of the model is taken with chamotte mud. The same process is applied on the other side of the model. The two chamotte are brought together, glass molding bowls are separated from mud and they are left for drying.



Photograph 7. Making Chamotte Mud Mould of the Goddess Figure

The dried chamotte mould's first baking is carried out at 950-1000 °C. If the inside of chamotte mould brought from the first baking cannot be reached, the powder quartz prepared in water is stuffed in female mould and all the inner surface of the mould is covered with watered quartz.

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Photograph 8. The process of covering the inner surface of the chamotte mould with quartz

In the fourth step, waste bottles and broken window glass are smashed between two clothes with a hammer and they are made into small pieces.



Photograph 9. Breaking Glassware Pieces and the Processes of Preparation

In the fifth step, the broken glass are filled in the chamotte mud mould. The most important point to take into consideration in this process is to put about half of the glass that is put into the main mould into the spare reservoir. Otherwise, when the glass is melt, half of the mould could become empty since the glass changes in both volume and physically. Moreover, another important point to take into consideration is to tie the chamotte mould with construction wire in a few laminar. The more carefully and stronger the tie is carried out, the more the separation of the tie is prevented.



Photograph 10. Tying the Chamotte Mould with String and Filling It with Glass

In the sixth step, mould is put in a cabin furnace and the cooking process is carried out at to 930°C, the melting temperature of glass by supporting the around of mould so that the mould will not overturn.

In the last step, after the temperature of the furnace decline below 50 °C, the cover of the furnace should be carefully opened. After the strings of the mould taken from the furnace, the mould is broken or its strings are untied. The burrs of the glass product taken out of the mould are burred with the help of sharpening stone and the product is polished with transparent spray varnish.



Photograph 11. The steps of baking and opening moulds

Depending on the height of the inner-side of the furnace, Pate de Verre technique could be applied for any desired Chamotte Mould.

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Application Samples



Photograph 10. Phrygian Period Mother Goddess Glass Samples and Horse Figure formed in Pate de Verre Technique with Chamotte mud mould

Result and Suggestions

It has been a very long time since the first manufacturing of glass and its products to the development of today's techniques and technological conditions. Despite these developments, there are still same failures in some processes, particularly in the process of glass manufacturing. It is thought that the dimensions of the glass sculptures made with Pate de Verre technique are about 20-30 cm. Among the disadvantages of Pate de Verre technique, the burst and breaking down features of plaster could be stated. It has been determined from the previous studies and application works on Pate de Verre technique that it is very difficult to make glass sculptures/objects (60-70 cm) in big sizes in plaster mould. When the Mother Goddess figures made from glass throughout the history are examined, it is clear that they are not very common but scare. One of its reasons is that glass material is complicated and the difficulty of getting one piece of work from a material consisting of several pieces.

With the technique Chamotte mud mould, the subject of this study, some animal figures were made in addition to the human sculptures. Moreover, some applications were carried out with the glass wastes collected from nature with this technique. According to the findings of this study, it was possible to produce bigger size forms with Chamotte mud mould. However, very complicated shapes should not be chosen, the furnace should be cooled slowly and the cover of the furnace should not be opened before the furnace completely cools. Watered quarts should be used as separator so that the glass does not adhere to inner surface of the mould. The mould should slowly be opened and the fragility of glass should not be forgotten. One of the disadvantages of this study is that the glass could chap in the mould since the shock cooling.

A dull colour could occur in the glass forms and it is possible to remove this dull colour with the polishers like transparent varnish. A few small holes should be made on the surface of the Chamotte mould with a thin nail so that the fluidity of glass could be provided.

Different types of glass in different temperatures should be researched so that brighter glass and more glass effect could be obtained.

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