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BHUTAN STANDARD

Production Process of Pottery and Ceramics Products



ICS 81.060.01

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BHUTAN STANDARDS BUREAU
The National Standards Body of Bhutan
Ministry of Industry, Commerce and Employment
THIMPHU 11001

Draft Bhutan Standards for public comments

July 2023

Price group C

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BTS XXX: 2023

FOREWORD

This Bhutan Standard for 'Production Process of pottery and ceramics products' was drafted by Sub-Committee on Pottery/Ceramics SC 01 and adopted by Bhutan Standards Bureau after the draft finalized by the Textile and Handicraft Technical Committee TC 06 and approved by the Bhutan Standards Bureau Board (BSB Board) in July 2023.

This standard is subject to systematic review after five years to keep pace with the market trends, industrial and technological developments. Any suggestions and further information may be directed to the concerned Technical Committee.

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Production Process of pottery and ceramics products

1 Introduction

Dzazo or the art of making pottery is one of the oldest handicrafts in Bhutan. It plays an important role in understanding our past, and culture. While there is no documentation on the history of pottery, this craft is believed to have propagated on a large scale during the time of DrubchenThangthongGyalpo (1385-1464) and Terton Pema Lingpa (1450–1521). The art flourished during the time of Zhabdrung Ngawang Namgyel and the fourth Desi Tenzin Rabgye, and is believed that pottery was first practised in Rinpung in Paro, Wangbama in Thimphu, Shar Goenka in Wangdiphodrang, and Gangzur in Lhuentse district.

While this art is not as popular as other crafts, it is still vibrant in some pockets of the country like Gangzur in Lhuentse, and Tongtongphay in Tongsa. The community has a strong sense of identity and is proud to be practicing this heritage. Organizations such as UNDP, Tarayana Foundation, Agency for Promotion of Indigenous Crafts (APIC) and the respective Dzongkhags have supported in reviving this age-old tradition of making pottery by hand as well as ceramics using imported machinery and clay.

This document captures the standard guideline on making pottery and ceramic products. This will not only help document the age-old practice of *dzazo* but also assist organizations and individuals pursuing research in this field.

2 Scope

This standard specifies the production process (both traditional and contemporary) of pottery and ceramic products.

3 Normative References

No normative references are cited.

4 Terms and Definition

For the purpose of this standard, the following definitions shall apply.

1.1. Phithi (kur.)/Peedilang (mon.)

Sieve.

1.2. Panglap(kur.)/Ponglap (mon.)

Wooden plank.

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1.3. **Taypa(kur.)**

Wood block with protruding cylinder.

1.4. **Pethmayla(kur.)/Lem (mon.)**

Flat wooden modelling tool.

1.5. **Zharma (kur.)/Nungwa-tek-no-lok (mon.)**

Ribbon tool(ring) for removing clay during decorating and sculpting.

1.6. **Ngangzharma(kur.)/Nung-tek-no-la (mon.)**

Process of sculpting and removing excess clay.

1.7. **Tukpun(kur.)**

Piece of wet cloth.

1.8. **Kempa(kur.)**

Tongs.

1.9. **Gangola (kur.)/Gangalung (mon.)**

Pebble.

1.10. **Lacha (kur.)/Lachala (mon.)**

Lac.

1.11. **Khungtola (kur.)/Tokma (mon.)**

Beater (to beat the clay to make it into powder).

1.12. **Zhor (kur.)/Sey (mon.)**

Locally brewed alcohol.

1.13. **Kaw (mon.)**

3 legged stand made from wood.

1.14. **Thow (mon.)**

Wooden hammer.

1.15. **Lok -togma (mon.)**

Metal rod used for taking out products from the fire.

1.16. Pokpa-Lukshub (mon.)

Leather gloves.

1.17. Ceramics

A class of brittle, inorganic, non-metallic materials produced by high temperature processing.

1.18. Glaze

Having a shiny surface or coating.

1.19. Ribbon tools

Flattened metal ribbons with sharpened edges used mainly to trim the bases of thrown pots, and hollow out handmade shapes. They come in a variety of shapes and sizes for all types of clay work.

1.20. Dzazo (Dz.)

The art of making pottery.

1.21. Pottery

Pots made of fired clay.

1.22. Wedge

The process of removing any air from within the clay.

1.23. Kiln

Special oven for firing pottery and ceramics.

1.24. Needle tool

Tool for making smooth cuts-trimming, carving and piercing clay.

1.25. Teepee

Conical shape.

1.26. Pinching

It is a way of modelling the clay with fingers and thumbs and is the basic method while making potteries.

1.27. Bisque firing

Is a process of hardening the clay into ceramics as well as making it porous and therefore suitable for glazing.

5 Raw materials

5.1 Traditional method

Red clay, White clay, Water, and Lac

5.2 Contemporary method

Red clay, White clay, Water, Glaze and Wax

6 Product designs

6.1 Traditional

6.1.1 Gangzur Product

- a) **Jhartsa(kur.):** Container to store fermented wine
- b) **Lengka(kur.):** Small container to collect *zhor* while brewing *zhor*.
- c) **Jhapheng(kur.):** Container for making tea
- d) **Ngachenma(kur.):** Container for cooking curry
- e) **Wha-lee (kur.):** Container for preparing and warming *zhor*
- f) **Bumter(kur.):** Vase to store religious relics
- g) **Sangphor(kur.):** Container for burning incense powder

6.1.2 Tongtongphay Product

- a) **Songphor (mon.):** Container for burning incense powder
- b) **Mok (mon.):** Mug for tea and water
- c) **Shongbar (mon.):** Bowl for serving curry
- d) **Jambi (mon.):** Teapot for making and serving tea
- e) **Mendo Pe (mon.):** Container for flower plantation
- f) **Tau-bok-ghi-Pe (mon.):** Container for making curry
- g) **Tau- Chamney- la -Pe (mon.):** Container for making rice
- h) **Bar Pe (mon.):** Small container used for brewing Sey.

7 Production methods

7.1 Traditional Process

7.1.1 Gangzur method

- i. Collect red and white clay
- ii. Mix red and white clay in the ratio of 4:1
- iii. Dry the mixture in the sun for two-three days
- iv. Beat clay into powder using *khungtola*.
- v. Sieve clay using *phithi* (bamboo sieve)
- vi. Mix clay with water and knead into a dough
- vii. Beat dough using *thowa* (wooden hammer) until the dough is soft with consistent moisture, eliminating air bubbles that may have been trapped when the clay was mixed.
- viii. Take the dough on the *panglap* and place it on the *taypa*.
- ix. Use hand to shape the dough accordingly (into any desired product shape).
- x. Use hand (knuckles or tips) to make the hole at the center.
- xi. Apply water on the outer surface. This will enhance and smoothen the surface.
- xii. Dry the product in the sun for 30-60 minutes. For products with handles, the handle is attached to the actual piece at this stage.
- xiii. Dry the product in the shade for 1-2 days.
- xiv. Remove the product from the *panglap* and start making the base using additional dough.
- xv. Finish the base using *petmayla* and dry in the sun for 1 hour.
- xvi. Finish the inner surface using *zharma*. This process is called *ngangzharma*.
- xvii. Dab the inner surface with a piece of wet cloth (*tukpun*). This will level and smoothen the surface.
- xviii. Even-out further using a pebble and later add the finishing touches with a *tukpun* and *petmayla*.
- xix. Dry in an enclosed space/room for 3-4 days away from sun and wind. This prevents formation of cracks.
- xx. Prepare to make a fire in a teepee form. The tips of the fire wood should come together like poles of a tepee. Use only soft wood.
- xxi. First, place the product strategically with the rim facing the fire. The rim will start turning black.
- xxii. Second, place the whole product in the center of the fire ring with fire wood circling the products.
- xxiii. Keep it for an hour until it turns red.
- xxiv. Take the product out of the fire using *kempa* and begin applying *lacha* immediately on the outer surface including the rim. Applying *lacha* when it's hot melts the *lacha* making it easier to apply.

Note 1: For the handle, a portion of the dough is kept aside to make the handle (after step vi). The dough is stored in an airtight container/plastic bag to retain moisture. After the body of the pot is dried, the handle is made and attached to the body (after step xi).

Note 2: Lacha is generally applied only on the outer surface of the product including the rim. Upon request of the customer, it can be applied on the inner surface as well.



Picture 1: Beating dough using *thowa*



Picture 2: Dough on the *panglap* which is placed on the *taypa*



Picture 3: *Taypa*(wood block with protruding cylinder)



Picture 4: Dipping water on the outer surface to enhance and smoothing the surface



Picture 5: Making the base using additional dough



Picture 6: Finishing base using *petmayla*



Picture 7: Finishing the inner surface using *zharma* (ring ribbon tool)



Picture 8: Placing product rim facing the fire



Picture 9: Preparing fire in a teepee form.



Picture 10: Applying *lachaon* the product which is taken out of the fire using *kempa*

7.1.2 Tongtongphay method

- i. Collect red and white clay
- ii. Mix the white and red clay.
- iii. Dry the mixture in the sun for two-three days
- iv. Beat clay into powder using *tokma*
- v. Sieve clay using *Phidilang*(cane/metal sieve)
- vi. Mix clay with water and knead into a dough
- vii. Knead the dough further on the table until the dough is soft, fine and the air bubbles removed.
- viii. Take the dough on the *ponglap* and place it on the *kaw* (3 legged stand made from wood)
- ix. Use hand to shape the dough accordingly (into any desired product shape)
- x. Use thumb to push into the center of the ball of a dough and start pinching up the walls.
- xi. Turn the piece as you pinch. This will help you keep an even thickness in the walls
- xii. Apply water on the outer surface. This will enhance and smoothen the surface.
- xiii. Dry the product in the sun for 30-60 minutes. For pieces with handles, the handle is attached at this stage.
- xiv. Dry the product in the sun for 1-2 days until it is completely dried.
- xv. Remove the product from the *ponglap*.
- xvi. Finish the base by beating gently with *Thow*.
- xvii. Even out the base further with *Lem*.
- xviii. Dry in the sun for 1 hour.
- xix. Finish the inner surface using *Lok*. This process is called *Nung-tek-no-la*.
- xx. Level and smoothen both inner and outer surface with hand and dry in the sun for half an hour.
- xxi. Even-out further (both inner and outer surfaces) using a *gankalung* (pebble).
- xxii. Dry in the sun for 2-3 days. Avoid contact with water or rain.
- xxiii. Prepare the fireplace and arrange the products on the wire mesh stove and fire the products on low heat until the products turn colour.
- xxiv. Increase the heat and keep it for more than an hour until it turns red.
- xxv. Cool down the product heat naturally and increase the flame again and fire the products till the products turn red.
- xxvi. Add fresh wood and create smoke to turn the product colour into Black, as buyers prefer black.
- xxvii. Take the product out of the fire using a *Lok togma* (metal ladle) and begin applying *lachu* immediately on both inner and outer surface. Applying *lacha* when it's hot melts the *lacha* making it easier to apply on the surface.

Note 1: Generally, they use more of white clay. They source both the clays from Punakha.

7.2 Contemporary process

7.2.1 Imported clay

- i. Wedge clay by hand. This process thoroughly homogenized the clay, and removes all air bubbles.
- ii. Throw the clay to the wheel.
- iii. Force the clay to the centre of the wheel by applying pressure with the hands. This process is called Centring.
- iv. Using thumb, make a hole in the center. This opens out the piece.
- v. Start levelling the rim.
- vi. Level and lift the wall.
- vii. Shape the product into any desired shape.
- viii. Refining the shape with ruler(wooden or plastic is preferred).
- ix. Cut out excess height (or if it's distorted) with a needle.
- x. Level and finish the rim.
- xi. Cut the finished product with wire from the wheel and place it on a piece of ply board.
- xii. Let it dry (indoors) for 2-3 days but in between, inspect for any defects so it can be corrected.
- xiii. Place the product upside down on the wheel and start trimming.
- xiv. Handles can be attached and patterns created at this stage if desired. Handles are hand moulded and fixed with clay slurry and slip from the prepared wedged clay. Clay slurry is applied using a brush.
- xv. Dust the product using a wet sponge or a brush and set it aside (indoors).
- xvi. After 2 weeks, start the firing process. Begin with bisque firing in a kiln at 800-900degree C for 9 hours.
- xvii. Let the kiln cool before taking out the products.
- xviii. Clean using a wet sponge and start applying wax on the bottom so that the product doesn't stick to the kiln when glazing.
- xix. Dip the products in the glaze and set aside to dry for 10 minutes.
- xx. Clean the bottom and begin firing at a temperature of 1250 C for 15 hours. Continue firing for another half an hour at 1650 C.
- xxi. Put off the kiln leaving the products inside for 3 days. This cools down the product and also prevents cracking.

Note: In case of ceramics made from local clay (red and white clay), the entire process is the same as above except for the preparation of clay and bisque firing. Here, the clay is not mixed. Instead, it's either white clay only or red. Once the red clay is collected (sourced from Punakha), the clay is soaked in water for 1 week after which it is stirred well and sieved on a metal mesh using a scraper. The sieved clay is poured in a container and set aside. Once the water and the clay separate, the water is removed using a sponge. Once the water is removed, the clay is put on POP slabs and set to dry in the sun for about 2 days. The clay is then kneaded and wedged, and thrown on the wheel. The same process follows until when the product is ready for bisque firing. The bisque firing is carried out at a temperature of 750 C for 7 hours. Once cooled in the kiln, the product is ready. Here, glazing is not carried out.



Picture 11 Kiln Machine

8 Test

The overall workmanship is assessed visually. For instance,

1. The product must be dried completely. This is determined by the colour as it turns yellow.
2. The product must be fired properly. The colour turns red indicating it is ready. This process also ensures there will be no holes resulting in leakages, or formation of cracks.

9 Tools and Equipment

8.1 Traditional

8.1.1 Gangzur tools

- a) Pickaxe
- b) spade
- c) crowbar
- d) bamboo basket
- e) phithi,
- f) panglap
- g) taypa
- h) lem
- i) zharma
- j) tukpun
- k) kempa
- l) khungtola
- m) thowa

8.1.2 Tongtongphay tools

- a) pick axe
- b) spade
- c) crowbar
- d) Tokma
- e) Phidilang
- f) Kaw
- g) Thow
- h) Lem
- i) Lok
- j) Gankalung
- k) Lok togma
- l) Ponglap
- m) leather gloves
- n) buckets

8.2 Contemporary tools

- a) Ribbon tool
- b) Brush
- c) Ruler
- d) Sponge
- e) Wire

- f) NT Cutter
- g) Gas operated Potter's wheel
- h) Gas operated Kiln
- i) Needle tool

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