เทคนิคการสร้างแผ่นแบนในการออกแบบไบโอนิคของโคมไฟเซรามิค

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บทคัดย่อ

เซรามิคเป็นส่วนสำคัญของวัฒนธรรมดั้งเดิมของจีนและเปรียบเสมือนเป็นไข่มุกที่สดใสในงานศิลปะและงานฝีมือของจีน เทคนิคการผลิตเซรามิคแบบดั้งเดิมได้รับการอนุรักษ์ไว้อย่างสมบูรณ์และสืบทอดมาจนถึงปัจจุบัน ซึ่งได้รับการพัฒนาตามการเปลี่ยนแปลงของยุคสมัยและความต้องการด้านสุนทรียศาสตร์ และได้รับการสร้างสรรค์ขึ้นใหม่เป็นอย่างดี การออกแบบโคมไฟเซรามิคที่ผ่านการวิเคราะห์องค์ประกอบการออกแบบ เช่น วัสดุของเซรามิค การสร้างแบบจำลอง วิธีการขึ้นรูป และแนวคิดการออกแบบ รวมถึงสถานะของการพัฒนาโคมไฟเซรามิคทั้งในและต่างประเทศ โดยบทความนี้กล่าวถึงความเป็นไปได้ของการขึ้นรูปฐานโคมไฟเป็นเทคนิคในการออกแบบโคมไฟเซรามิค และนวัตกรรมในการออกแบบโคมไฟเซรามิค

บทความนี้มีวัตถุประสงค์คือ 1) เพื่อสำรวจความเป็นไปได้ของวัสดุเซรามิคในการออกแบบโคมไฟ สืบทอดประเพณีและผลักดันให้เกิดรูปแบบใหม่ 2) เพื่อรวบรวมแนวคิดการออกแบบที่เรียบง่ายและเหมาะสมกับการออกแบบโดยสะท้อนถึงการสร้างอารมณ์แบบดั้งเดิมของจีน และแนวคิดการออกแบบของ “เครื่องมือในการนำทาง และสิ่งต่าง ๆ เพื่อสื่ออารมณ์” ในบริบทของการสร้างสรรค์แบบจีนดั้งเดิม และ 3) เพื่อใช้แนวความคิดในวัตถุเฉพาะผ่านรูปแบบภาษาในการถ่ายทอดความสนใจที่สะท้อนถึงความสุนทรีย์ ซึ่งผลการวิจัยพบว่า เทคนิคการสร้างฐานโคมไฟเป็นการแสดงออกทั่วไปของการสร้างสรรค์งานศิลปะเซรามิคสมัยใหม่ ศิลปินนิยมใช้พื้นผิว สภาพความฉับพลันและความไม่แน่นอนในการแสดงผลงานของตน ตั้งแต่วิธีการปั้นดินเหนียวแบบดั้งเดิมไปจนถึงสมัยใหม่ วิธีการและเทคนิคการสร้างแผ่นคอนกรีตที่มีมากขึ้นอย่างต่อเนื่องด้วยกรรมวิธีการผลิตที่หลากหลาย เทคโนโลยีการสร้างแผ่นคอนกรีตแบบดั้งเดิมนี้จึงถูกนำมาใช้อย่างแพร่หลายในการสร้างสรรค์งานเซรามิคประเภทต่าง ๆ

คำสำคัญ: เซรามิค, การออกแบบโคมไฟ, เทคโนโลยีอาคารแบน, เซรามิคหัตถกรรม, การออกแบบไบโอนิคทางสัณฐานวิทยา

Redesign of Chinese Landscape Painting in Ceramic Decoration Case Study on A Thousand Miles of Rivers and Mountains

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Abstract

Ceramic is an important part of Chinese traditional culture and a bright pearl in Chinese arts and crafts. The production techniques of traditional ceramics have been completely preserved and passed on to this day and have been developed through the changes of the times and the needs of aesthetics and have been well innovated. The ancient ceramic making process of slab-building technology also plays an important role in modern ceramic making. Taking the design of ceramic lamps as an example, through the analysis of a series of design components such as ceramic materials, modeling, forming methods and design ideas, and combined with the development status of ceramic lamps at home and abroad, this paper discusses the feasibility of slab-building forming as a technique in the design of ceramic lamps, as well as the innovation in the design of ceramic lamps.

The objectives of this paper are 1) To explore the new possibilities of ceramic materials in the design of lamps, inherit the tradition and keep pushing forward the new; 2) To integrate the design concept of simplicity into this design, reflecting the Chinese traditional creation of the mood, and the design idea of “tools to carry the way, things to convey emotions” in the traditional Chinese context of creation. And 3) To use the idea and concept into the specific objects, and through the language of form, convey a certain interest and realm,

reflecting an aesthetic pleasure. The research results were found as follows; Slab-Building techniques are a common expression of modern ceramic art creation. Artists often use the texture, state, and suddenness and contingency to express their works. From the traditional clay paste method to modern, the methods and means of slab-building techniques are becoming more and more abundant. Due to the diversity of production methods, this traditional technology of slab-building has been widely used in the creation of various ceramic works.

Keywords: Ceramics, Lamp Design, Slab-Building Technology, Craft Ceramic, Morphology Bionic Design

Introduction

The development of modern pottery is a product of the influence of Western modernism in the 1980s and is flourishing in Chinese society today. The traditional process of forming clay tablets has gradually evolved into a way of speaking and expressing emotions through the continuous exploration of artists, highlighting a major advancement in contemporary pottery. The relationship between surface and surface that makes the artistic expression closer to the mind and enriches the space for the viewer's imagination and understanding, just as things are defined differently by different people who see them. Slab-building technology is a common way of expression in modern pottery creation, and artists often use the texture, state and suddenness of the slab-building to express their works. From the traditional single slab-building method to the modern day, the methods and means of clay forming have become more and more abundant. It is the diversity of production methods that allows the traditional technique of slab-building to be widely used in the creation of various ceramic works. China was the first country to invent and use ceramic lamps. Rites of Passage - Rites of the Eater: (《礼义食大夫礼》)：“大羹清不和，实于燈。宰右执燈，左执盖。“郑玄注”：瓦豆谓之燈。”“燈”is called lamps. The word “燈” here is pronounced the same as the Chinese character for lamp (灯) and is a generic character for the word lamp. With the process of modern design, materials are emerging, iron, acrylic and other materials gradually play the advantages of the original material instead of ceramic, coupled with the development of science and technology, lighting from the traditional fire light source to electric light source this, resulting in the gradual withdrawal of traditional ceramic lamps and lanterns from the market. Traditional Chinese lamps and lanterns are an important reflection of the material and spiritual aspects of traditional Chinese culture, with a representative national style and formal language, which makes traditional lamps and lanterns express the unique style and temperament of our national culture to the fullest. (Wei, 2018) As an indispensable category in Chinese ceramic culture, ceramic lamps and lanterns will come back to the public's view, and how to create ceramic lamps and lanterns that meet modern aesthetics, and function has become the focus of the author. Tradition and innovation always seem to be an important issue facing design, and how to find the combination of the two during diverse and complex conceptual changes and effectively retain the connotation and cultural characteristics of traditional Chinese crafts, is the key to innovation. (Zhao, 2010) The author's functional and decorative ceramic lamps and lanterns put forward higher requirements. To better reflect the value and meaning of ceramic lamps and lanterns in the space environment.

Research objectives

Ceramic lamps and lanterns as an integral part of daily-use ceramic, its development has not received much attention, and the stereotypical impression of ceramic lamps and lanterns has not changed. Therefore, the author uses ceramic as raw material to design lamps and lanterns.

1) To explore the new possibilities of ceramic materials in the design of lamps and lanterns, inherit the tradition and keep pushing forward the new; To integrate the design concept of simplicity into this design, reflecting the Chinese traditional creation of the mood, reflecting the design idea of “tools to carry the way, things to convey emotions” in the traditional Chinese context of creation.

2) To use the idea and concept into the specific objects, and through the language of form, convey a certain interest and realm, reflecting an aesthetic pleasure.

3) To use the idea and concept into the specific objects, and through the language of form, convey a certain interest and realm, reflecting an aesthetic pleasure.

Research Methodology

The research methods of this topic are mainly divided into the following three kinds.

1. Literature review

The author consulted relevant literature through websites, libraries and other means to make an overall summary of the information available and to clarify the feasibility and significance of the selected topic. At the same time to be able to more in-depth understanding of the origin and development of slab-building technology and the expression and expression techniques in modern pottery to provide sufficient theoretical basis for the author’s work design belt.

2. Analysis and induction method

The author collected the works of artists on major platforms at home and abroad, sorted them, and analyzed artists from different countries and different forms of artistic expression to draw inspiration.

3. Case study

Through analyzing the works of domestic and foreign artists, the author understands the method of clay sheet forming technique in the production of various ceramic works and the expression of ideas. The author understands realism and experimentation, as well as the randomness and chance in the clay piece forming works.

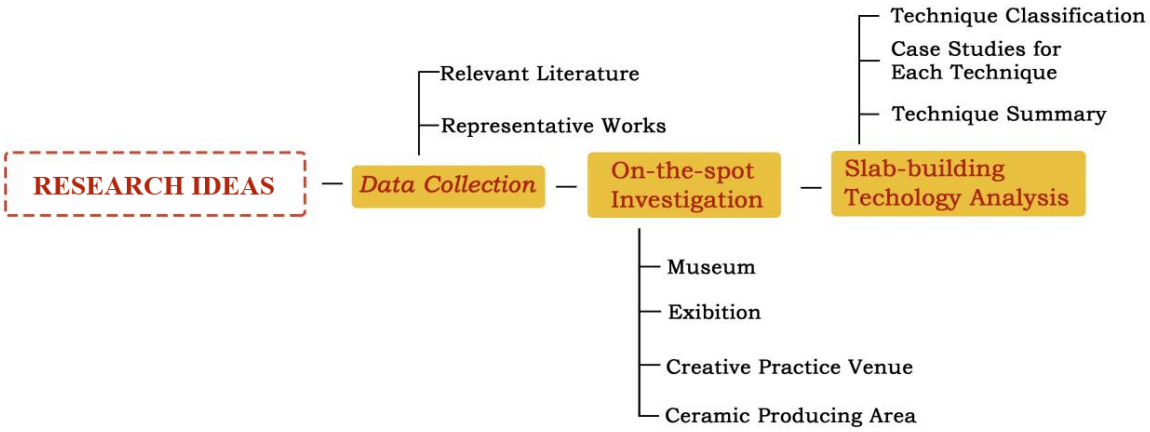


Figure 1 Research ideas mind map
Note: From © Shuai Fan 12/01/2022

Research ideas

Firstly, we collect information. By reviewing the literature, we can gain a comprehensive understanding of the research on the method of clay sheet forming, to provide a better theoretical basis and methodological guidance for the author's thesis. By collecting the representative works of outstanding artists in various periods, we can understand the development and application of the clay piece forming technique more intuitively.

Then, through fieldwork, I will analyze the current situation of ceramic decorative art and summarize the application of clay piece forming technique in ceramic decorative design. The author will visit museums, major exhibitions, creative practice bases and famous porcelain production areas to collect pictures of relevant works and analyze the pictures.

Summarize and organize the collected information and use the acquired content to make a comprehensive observation and analysis of the clay piece forming technique and ceramic decorative design. The analysis should be as comprehensive as possible, and the combination

of the two should be classified by using the information classification method, to classify the technique, the form of presentation of the works and the occasions used. Finally, summarize and reflect. The whole process should be repeatedly thought about, and the analysis method should be understood to summarize the experience for future research. What is more important is to know how to refine the research results and lay the foundation for the subsequent creation of works.

Keyword Definition

1. Ceramic lamps

In the Paleolithic Age, Beijing ape man invented and used fire. In the long river of history, through the change of life, the change of demand and the development of human civilization, — lamps appeared an indispensable product of human production and life. The ceramic lamps studied and produced in this article are a product made of porcelain clay and combined with a light-emitting device for lighting. Ceramic lamps consider the dual needs of use and aesthetics, both for lighting ceramic lamps, but also home furnishing and decorative functions.

2. Slab-Building Technology

Slab-Building is to press the used clay, which includes porcelain clay, earthenware clay and mixed clay, into a sheet. The pressing methods used are traditional hand lapping, modern clay plate machine pressing or pressing with wooden pottery tools, and then using the pressed clay pieces to create art. The clay used is divided into two forms: clay sheet and clay plate, depending on the thickness of the rolled clay. The slab-building technology is malleable and can be made in a variety of ways, but it is more difficult to fire and faces problems such as deformation and cracking.

3. Morphology Bionic Design

Morphology Bionic design is the study of the external forms of living things (including animals, plants, microorganisms, humans) and natural materials (such as sun, moon, wind, clouds, mountains, rivers, thunder, etc.) and their symbolic meanings, and how to apply them to design through corresponding. (Yu & Chen, 2005) According to the degree of similarity between the design object and the bionic prototype, morphological bionic is divided into figurative bionic, abstract bionic and imaginative bionic. (Li, 2010)

Case studies of domestic and international artists' works

1. Cody Hoyt's work study

The works of twisted colored body decoration are usually made into twisted colored clay plates or clay pieces and then printed and shaped, but if these twisted colored clay pieces are directly used to make a collage, it will form a contrast effect of movement and stillness with a calm shape but vivid pattern. Some contemporary artists have been the first to practice the feasibility of assembling clay panels or pieces directly into mosaics. (Wan, 2018)

Figure 2 Cody Hoyt's Clay patch splicing twisted colored body works
Note: From DESIGN CHINA, 2020

Here, Cody Hoyt's work employs both clay paneling and clay sheet press molding techniques. He arranged the color clay according to his design, used the clay sheet pressing technique to blend the clay with each other until there were no gaps, cut the desired shape of the clay sheet, and assembled the pieces with the technique of mounting.

2. Zhou Guozhen's work study

Zhou Guozhen is an artist who combines the technique of slab-building with ceramic decorative design. Zhou Guozhen is undoubtedly an authority on glaze preparation and use. He is no longer all about the equipping of glaze in pursuit of purely decorative effects, but more about the matching of works. For example, to better express the characteristics of animal skin or to produce sculptures that are mainly decorated with glaze and placed in the environment. (Zhang, 2012)

Figure 3 Zhou Guozhen's stick and mould clay works
Note: From 360doc, 2000

The combination of creation in animal form and decoration through high-temperature color glaze in ceramics can be traced back to the expression of Tang Tricolor in the Tang Dynasty. In recent years, with the improvement of scientific and technological means and the refinement of the original ancient books, the product range of ceramic glazes in this area has increased significantly, and there are not only various kinds of highly decorative glazes on the market, but also many medium-temperature glazes, which have enriched the decorative techniques of ceramics to a certain extent, and at the same time, the temperature and technical requirements of the kiln process have been reduced, which has improved the stability of ceramic molding and made it easier for the potter to create demand.

3. Zhu Legeng's work study

The figure of clay pieces is also frequently seen in environmental ceramics, and Zhu Legeng is undoubtedly one of the representatives who has brought the subject of clay pieces into full play in the architecture of public space. His work "Nirvana" uses the production method of slab-building and the decorative technique of luster to present.

The main body of the pinch sculpture consists of lotus flowers, Buddha's hand, lotus leaves, and the face of the Buddha, staggered and displayed on the wall of the National Museum of China against a large red background. Luster is used to decorate the interior of the objects, keeping the original white color of the ceramic on the exterior. As a pioneer of environmental pottery, this interactive experience allows the viewer to walk between the works, and the all-round experience of being in the pottery is the state that Zhu Legeng would prefer to see.

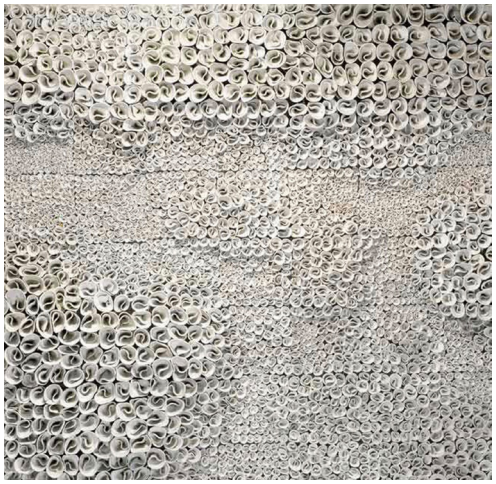


Figure 4 Light of Life
Note: From Baidu, 2019

4. Valeria Nascimento's work study

Valeria Nascimento is an environmental ceramicist who specializes in using small pieces of clay to create large images. Her works are based on abstract flowers or quadrangles or are arranged in small pieces of clay to form shapes. The arrangement is random, and the shapes vary in size. The works are often decorated with a combination of materials and ceramics, most often with wire, wood and ceramics to create a different sense of space. In the hanging works, the decorative techniques of color clay and gilding often appear. At the same time, it provides ideas for the author's decorative methods in the creation of his own works.

Figure 5 BLOOMING
Note: From Valéria Nascimento, 2022

Classification of slab-building techniques

Ceramics was born in China more than 9,000 years ago. The book “In China’s early mold method pottery making” (Yu, 1986) summarizes the clay paste technique as the most original slab-building technique. In the long history of the development of Chinese ceramics, the production techniques of slab-building have increased accordingly.

The works of slab-building techniques are mainly expressed in sculpture, environmental ceramics, traditional ceramics, modern pottery and so on. There are various production methods, which are mainly divided into five categories: clay coil building, clay pinch, clay mount forming, clay roll molding and mold assisted. Among them, the sculpture category mainly uses the production method of clay piece pinching; in the traditional ceramic art, the main expression is the production of purple sand utensils, which reached its peak in the Ming and Qing dynasties, using the clay mounting method.

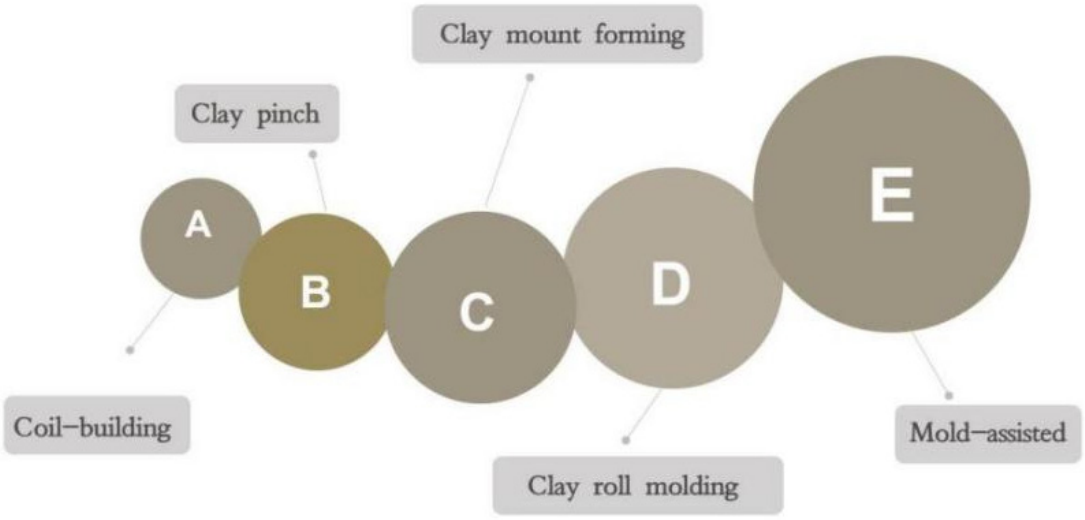


Figure 6 Classification of slab-building techniques
Note: From © Shuai Fan 12/01/2022

1. Coil-building

The technique of coil-building is one of the more common techniques used in ancient Chinese pottery making, which emerged earlier and is an integral part of the modern pottery making process and is then enclosed or decorated according to the shape of the vessel to be made.

In the process of enclosure, with the improvement of productivity and the development of tools, coil-building can also be made using a slow wheel. In the process of decoration, more variations of clay strips are often used for decoration. This decorative technique can be traced back to the earliest Neolithic pottery, and these uniform patterns not only serve as decoration, but also as representative totems of tribes or cultures.

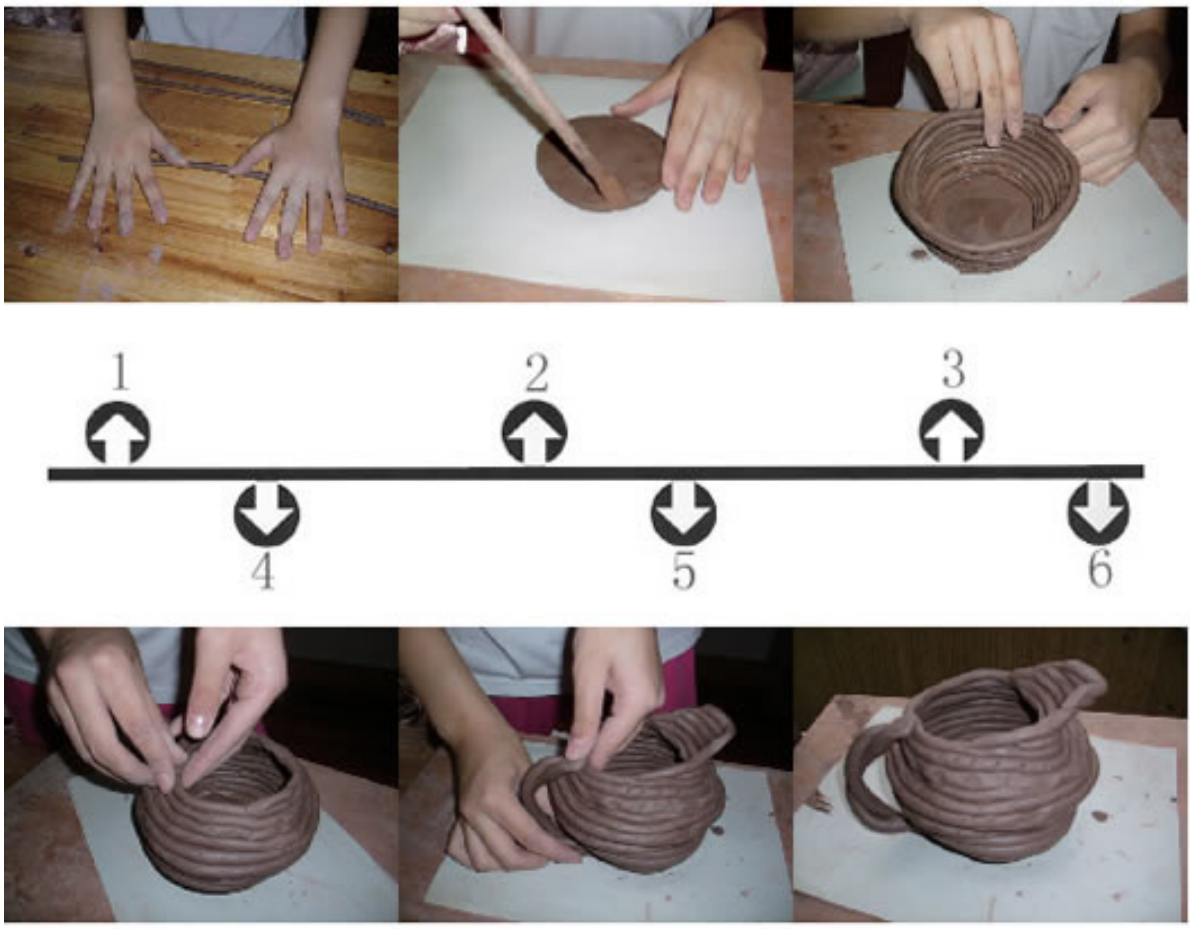


Figure 7 Coil-building making process
Note: From © Shuai Fan 12/01/2022

2. Clay pinch

Clay pinch technique is often used in the production of ceramic sculptures. The soft nature of clay makes it capable of shaping a variety of forms and is therefore favored by many sculptors.

Figure 8 Clay pinch making process
Note: From © Shuai Fan 12/01/2022

The clay piece can be flattened into different sizes and shaped in different dry and wet states. The size, state and presentation of the clay pieces are varied, and there are realistic ones. At the same time, the technique of pinching is embodied in Jingdezhen ceramics is the traditional hand-kneading of flowers in Jingdezhen, which has been named a national intangible cultural heritage.

3. Clay mount forming

In the production of inlay, the technique of clay mount forming is widely used. It is beaten into a plate of certain thickness with the help of tools, and then the clay pieces are cut into appropriate shapes with a knife or other tools when they are slightly dry and not easily deformed, and then the half-dried clay pieces are glued and gently beaten with jointing clay to make the clay plates glued tightly to each other.

Figure 9 Jingdezhen inlay making process
Note: From © Shuai Fan 12/01/2022

4. Clay roll molding

Clay roll molding technique is a production method in which clay of various textures is beaten into pieces, rolled into columns of different sizes, and then shaped. This method of production is primitive and has a variety of combinations and is used for environmental pottery and sculpture. In this era of modern pottery booming, I focus on analyzing the application of clay sheet roll molding in environmental pottery.

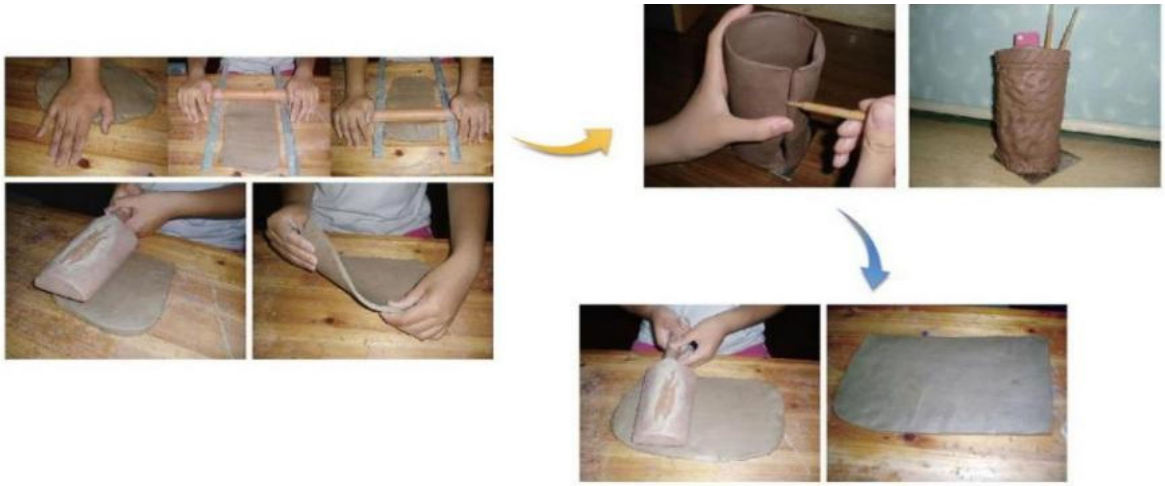


Figure 10 Clay roll molding making process
Note: From © Shuai Fan 15/01/2022

5. Mold-assisted

As the name implies, mold-assisted production techniques use the mold as the basic form, and the clay pieces are slapped or pressed on the inside of the mold. Nowadays, this method is widely used in the production of daily-use ceramics.

The material of the mold is usually made of plaster. The mold-assisted production method allows for consistency in the shape of the product, while increasing productivity and efficiency. It also has the effect of increasing the yield of the finished product in a mature production line. For example, ceramic factories use rolled head machines to press the shape. At the same time, the use of molds has been used in the production of Zisha pots since the Ming Dynasty.

The molds used in the production of Zisha pots are divided into internal molds, external molds, and component molds, such as the galls in Gongchun's gall pots, which were the first molds made in Zisha. The mold can also be used to make a regular or varied shape.

Figure 11 Clay roll molding making process
Note: From Zhihu, 2021

Creative design of ceramic lamps under the slab-building technique

Figure 12 Creative Design process
Note: From © Shuai Fan 15/02/2022

1. Design concept

This set of lamps and lanterns are designed through the observation of the outline of the mountains. The work focuses on the overall shape of the mountain range and outlines the hierarchical relationship between the mountain and the mountain, using the technique of clay sheet molding and the assistance of comprehensive materials to reflect the overall effect.

When the sun rises on a sunny day, the fog recedes, and under the illumination of the sun, the full appearance of the mountains can be well observed; on a rainy day when the humidity is high, the temperature on the mountain is low, and when the temperature on the mountain is lower than the dew point temperature of the air humidity, the fog is formed, which is another form; when night falls, the contrast between the sky and the mountain is obviously pulled apart, while the front and back of the mountain are gradually blurred.

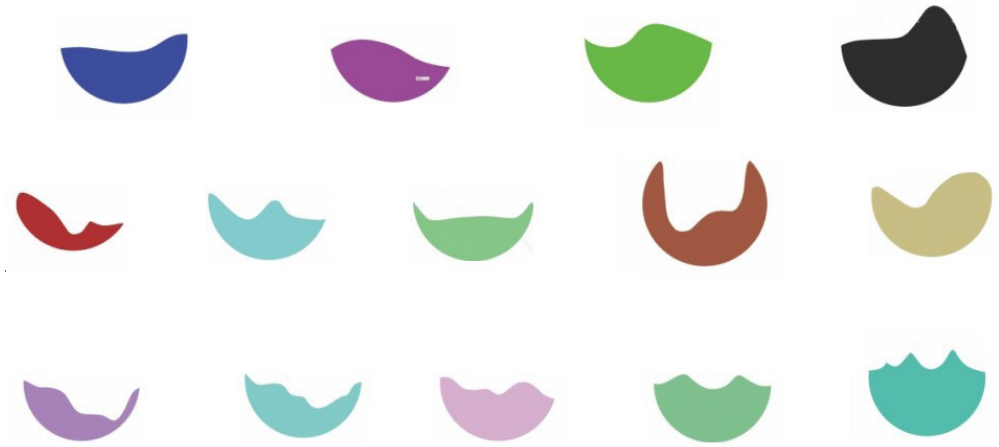


Figure 13 Lamp design expansion diagram
Note: From © Shuai Fan 20/01/2022

2. Artwork Size Chart

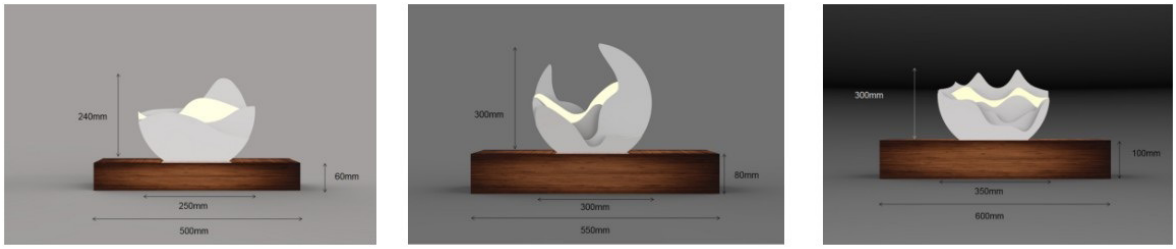


Figure 14 Lamp design size chart
Note: From © Shuai Fan 25/01/2022

3. Creation process

The production process of this set of works adopts the production process of clay plate pressing and molding, through the production of clay tablets, shape carving, repairing clay billets, drying and polishing, firing in the kiln and comprehensive decoration with wood art.

3.1 Clay slab production

This set of works is made by pressing the clay plate. The tools used are: linen cloth, blank board, pottery knife, water sponge, sandpaper sponge, polishing sponge, stain inhibitor, etc. The clay used is mainly high white clay. The thickness of the pottery clay slab machine setting needs to be pressed to the final thickness by reducing the scale in layers according to the thickness of the clay slab. A piece of linen cloth larger than the size of the required clay slab is placed on the operating table of the clay slab machine. Fold the linen cloth, place the clay in the middle of the linen cloth, turn the big handle wheel on the side of the clay plate machine clockwise, the clay piece is pressed into the set thickness with the rotation of the big handle wheel, and repeat the pressing several times into the final required thickness (Figure 14). Finally, the clay sheet is removed together with the linen cloth and placed on the blank board. When the clay sheet is dried until it is not easily deformed, the linen is removed for the next step.

Figure 15 Making Process (1)
Note: From © Shuai Fan 30/01/2022

3.2 Shape drawing

After pressing the clay slab, take a blank of the same size as required to cut out a round clay slab, place it on the table, and then use a knife with a blade at 25 degrees diagonally downward to draw the designed shape.

Step 4: Slap Roller pressing

Step 5: Shape engraving

Figure 16 Making Process (2)
Note: From © Shuai Fan 30/01/2022

3.3 Repairing the clay blank

After drawing the shape, take off the excess clay pieces. During the pressing process the linen took away some of the moisture in the clay, and the pottery knife drew the pattern with a slight crack at the edge part, which was repaired with a brush to make up for the water, followed by a blank board over the clay piece to flatten it and prevent warping. The area where the knife cut marks on the edge of the clay piece were evident was left to dry and then re-scrapped with a razor blade in preparation for polishing.

Step 6: Edge condition, Slightly cracked

Step 7: Cracked water replenishinig

Step 8: Cracked water replenishing

Figure 17 Making Process (3)
Note: From © Shuai Fan 30/01/2022

3.4 Bone dry and sanding

The clay billet is wrapped with linen cloth, and the surface of the clay piece has a linen cloth pattern (Figure 21). When the clay billet is dried to 80%, the first rough polishing is carried out, mainly to polish the pattern of the linen cloth on the clay piece and check whether there are any internal injuries on the clay piece (Figure 22). When the clay pieces are completely dry, the bisque firing is done in the kiln at about 700 degrees (Figure 23). At the end of the firing, the kiln is opened for inspection and deep sanding is carried out, alternating 800 grit and 3M sandpaper until the surface of all clay pieces is smooth.

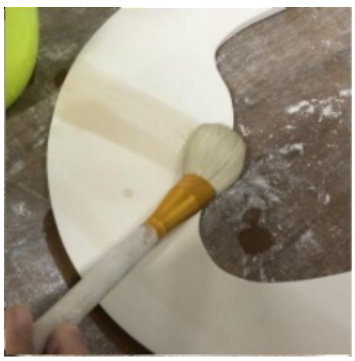
Step 9: Sanding

Step 10: Stacking and bisque fire

Figure 18 Making Process (4)
Note: From © Shuai Fan 30/01/2022

3.5 Firing

After the sanding, the last water replenishment and cleaning before entering the electric kiln was carried out, followed by firing at 1250 degrees.



Step 11: Water Replenishment

Step 12: Encasement

Step 13: Burning

Figure 19 Making Process (5)
Note: From © Shuai Fan 30/01/2022

With the high deformation rate of clay pieces, the kiln loading process first cleaned the kiln shelf with a brush, then evenly sprinkled with thicker alumina powder to prevent shrinkage from becoming larger and used electric kiln firing to reduce the chance of deformation of clay pieces during the kiln firing process, and to set the time and temperature of heating during the firing process. The firing program is set to two-stage heating, the first stage heating up to 500 degrees, 100 degrees per hour. The second stage is heated up to 1,250 degrees with 150 degrees per hour, and the oxidizing atmosphere firing is completed in ten hours.

3.6 Integrated material decoration

As the surface of the clay pieces are not glazed, it is necessary to spray antifouling agent on the surface after firing to keep the surface of the porcelain tile smooth and translucent. The bottom support device uses a solid wood base for the device, the wood lathe slotted, equally spaced, the width of the bayonet and the width of the porcelain tile consistently, to facilitate the porcelain tile can be more firmly placed on the base, to achieve more desirable results. The use of paste type light strip hidden in the porcelain tile gap, simple and beautiful.

Step 15: Spraying anti-fouling agent

Step 16: Card slot display

Step 17: Switch

Figure 20 Making Process (6)
Note: From © Shuai Fan 30/01/2022

3.7 Product display

The work is done by slab-building technology, and the firing temperature is 1,250°. The base is equipped with an equal amount of internal bayonet structure according to the number of ceramic tiles, which not only can play a better role in fixing ceramic pieces but also can be well hidden and beauty. The recessed shape makes the ceramic piece's placement area increase and strengthens stability.

The side of the clay pieces with gold-plated decoration makes the overall effect simpler but does not lose the sense of design. Light shows the way the author used the touch strip for installation, which is characterized by easy to hide and adjustable strip length. Touch switches have advantages of high safety performance, fast response time, easy to clean and so on.

Figure 21 Complete product display
Note: From © Shuai Fan 25/01/2022

Review of the practice process

Technical difficulties encountered in the study

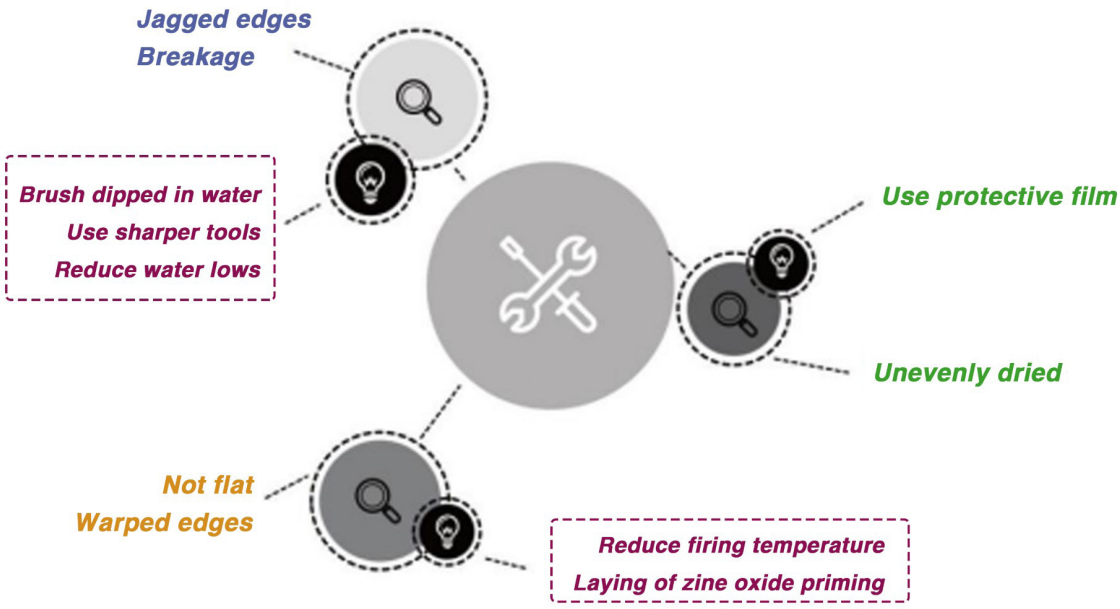


Figure 22 Problem and solution in the study
Note: From © Shuai Fan 30/01/2022

The material chosen for this design is Jingdezhen Delta 608 clay, which appears pure white after firing at medium and high temperatures (1,180 - 1,280). The reason for choosing this clay is to consider that the final presentation of the work has a softer visual effect, and the theme of warm light and white can make the space more delicate and soft as a whole.

1. Problem

1.1 The process of drawing the shapes, due to the nature of the clay, leads to various jagged edges, and this jaggedness manifests itself as edge breakage on the dried clay, and in serious cases, even leads to the breakage of the entire clay slab.

1.2. During the drying process, the clay slice is unevenly dried leading to a warped edge situation, which seems to have been unresolved; the thickness of the clay slice becomes a situation that I must consider.

1.3 After firing, it was always found that the porcelain pieces were not flat enough, as well as cracks caused by warped edges. This problem continued to occur after the second firing experiment.

2. Solution

2.1 After the test was learned that the clay slabs jagged is due to the repeated extrusion of through the clay plate machine, moisture was wrapped with clay linen away, making the clay become drier; improvement method is that the clay in the table as evenly as possible after the clay slab machine to press the shape, which can reduce moisture loss, while changing to a surgical blade, the blade slanted down 45 degrees, to draw smooth lines, and in the drying The process is promptly repaired by using a brush dipped in water, which makes the drying speed of the edge reduced. Solve the problems caused by jaggedness and too fast drying.

2.2 During the drying process, a protective film is used to wrap the clay slab, making the drying speed of the whole slab decrease and the drying degree tend to be consistent.

2.3 The problem of warped edges after firing has been difficult to solve. Due to the thinness of the overall design of the clay sheet, it is easy to break. In the third firing experiment, after consulting books, it was found that the chance of deformation of porcelain pieces could be

changed by lowering the firing temperature, so the firing temperature was lowered from 1,280 to 1,250; after the test, it was found that the deformation rate still existed, but the degree of deformation was reduced. In the review of “ceramic technology” (Zhao, 2010) it found that the deformation may be caused by inconsistent shrinkage during firing, so according to the method in the book, the clay slab and shed plate between the laying of zinc oxide priming, so that the overall shrinkage ratio of clay tablets is consistent. The problem was solved.

Conclusion

This set of works takes the circle as the basic type, symbolizing the square and circle of heaven and earth, extracts the edge lines of the mountain range, uses the overlap of the edge lines to form the figure, and then separates and reorganizes the figure through the computer software. The production technique of slab-building technique is used to carve the lines. It is written in the Zhou Yi Tai Hang: “The small goes to the big comes, auspicious, and prosperous. It is the reason why heaven and earth intersect, and all things pass.” (Zhao, 2016) The design where the components are separated corresponds to the Qian trigram in the Tai trigram, while the three groups of works placed opposite each other are the Kun trigram.

Through the investigation of the slab-building technique in ceramic lamps, it is concluded that the ancient pottery production techniques and decorative techniques have influenced the creation of contemporary ceramics, and the slab-building technique is not only a continuation of the historical production methods, but also a continuous innovation of decorative techniques. It can learn from history and develop innovation. At the same time, the application of slab-building technology in ceramic lamps and lanterns makes the works form a unique and distinctive personal style, so that the works can achieve a refreshing feeling and show more possibilities for the development of contemporary ceramics.

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