

# The artistic embodiment of copper casting in furniture modeling

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## Abstract

This paper discusses the unique embodiment and application of copper casting technology in furniture plastic arts. Through the in-depth analysis of the history and process characteristics of copper casting technology and its innovative application in modern furniture design, this paper reveals how copper casting endows furniture with rich artistic connotation and unique aesthetic value. The study pointed out that copper casting not only provides a solid and durable material foundation for furniture, but also becomes an important means to show the charm of furniture plastic art through the characteristics of delicate texture, changeable form and strong plasticity. The article also shows the balance and integration of copper casting furniture between inheritance and innovation through specific case analysis, and further emphasizes its irreplaceability in contemporary furniture design.

**Keywords:** Bronze Casting, Furniture Design, Artistic Expression, Craft Characteristics, Innovative Application

## 1. Introduction

As an ancient and exquisite metal processing technology, copper casting technology is particularly prominent in the art of furniture modeling. Its unique technological characteristics and significant advantages not only give the furniture excellent practical performance, but also add rich cultural connotation and aesthetic value.

In the long river of human civilization, the application and development of metal materials has always been an important force to promote social progress and artistic creation. Copper, as a precious metal with a long history, has shown extraordinary artistic charm in many fields such as sculpture, architecture and utensil making since ancient times because of its excellent physical properties, rich color changes and unique cultural symbolism. With the progress of modern industrial technology and the innovation of design concept, the application range of copper materials continues to expand, and its exploration in the field of furniture design is particularly eye-catching. In particular, copper casting technology, as the treasure of metal processing art, provides unprecedented creative space and technical support for furniture modeling design, making furniture not only meet the practical function, but also become a work of art carrying profound cultural heritage and aesthetic value.

The research on the artistic embodiment of copper casting in furniture modeling first comes from the deep insight into the fusion trend of traditional craft and modern design. Under the background of globalization, the inheritance and innovation of traditional culture has become the topic of The Times. Copper casting, as an important part of traditional handicraft, is not only a tribute to traditional culture, but also an exploration of modern life aesthetics. Through copper casting technology, furniture designers can create design works with classical charm and modern sense to meet the market demand for personalized and differentiated furniture products.

### **Research background and significance**

Copper casting technology, as an important chapter in the history of human civilization, its history and development are full of rich connotation and unique artistic value. The history of copper casting dates back to around 3000 BC, when the civilizations of ancient Egypt and Mesopotamia had mastered the art of making bronze, the natural alloy of copper and tin. People in these regions discovered the advantages of bronze and began to use it to make simple tools and ornaments, such as daggers, knives, and pins. With the advancement of technology, people began to consciously match the ratio of copper and tin to obtain bronze with different hardness and uses.

Bronze casting technology spread between different civilizations through trade and war. For example, ancient Egyptian bronze technology may have spread to ancient Greece and Rome, while Chinese bronze technology was communicated to Central and Western Asia via the Silk Road. Bronze casting technology was particularly developed in China, especially during the Shang (circa 14th to 11th centuries BC) and Zhou (circa 11th to 256 BC) dynasties. In this period, the production of bronze ware reached a very high artistic level, and there were many exquisite objects, such as tripod, zun, and jue. China's bronze casting technology is dominated by the model casting method, that is, the use of pottery to cast objects, which makes the ancient Chinese bronzes have a high degree of artistry and technology in shape and decoration.

Entering the Western Zhou Dynasty, China's bronze casting technology has been further developed and improved. The casting process was not only applied to the production of agricultural utensils, chariots and weapons, but also gradually formed a unique bronze culture. With the changes of The Times, bronzes play an increasingly important role in social life, and their types and quantities are also increasing. In the Han Dynasty, bronze casting technology reached an unprecedented peak, and large bronzes such as bronze bells, bronze tripod and bronze horses emerged one after another, becoming an important representative of Han culture.

During the Tang Dynasty, copper casting technology was further developed, and many exquisite artworks appeared, such as copper Buddha statue, copper eagle statue, copper camel statue, etc., which demonstrated the outstanding achievements of Tang Dynasty art. In the Ming and Qing Dynasties, although the copper casting process was greatly impacted, there were still a group of craftsmen who adhered to the traditional process and created many excellent copper works. These works not only inherit the fine tradition of the previous generation, but also innovate in technique and style, showing the lasting vitality and artistic charm of copper casting process.

In modern times, the copper casting process has shifted from manual to mechanized production, but the precision and complexity of the traditional process has been maintained. The development of modern technology makes the production of copper ware more efficient, but also provides more possibilities for the innovation and development of copper casting process. Copper casting process is not only used in art production, but also widely used in furniture modeling and other fields, which brings rich inspiration and unique aesthetic value to modern design.

In summary, the history and development of copper casting technology is a vivid portrayal of the progress of human civilization. From the initial simple casting to the later complex process, the copper casting process has witnessed the accumulation of human wisdom and technological progress. In the future, the copper casting process will continue to play an important role in the fields of art creation and furniture design, contributing more to the development of human civilization.

### **Research objectives**

This study aims to deeply explore the unique embodiment and far-reaching influence of copper casting process in furniture plastic art, aiming to reveal the artistic value and technical characteristics of copper casting furniture as well as its integration and innovation path in modern furniture design through systematic analysis and research. Specifically, the purpose of this study can be refined into the following points:

1. Dig historical inheritance: Trace the historical origin of copper casting process, sort out its application and evolution in furniture making in different historical periods, and explore how it can be preserved and developed as a traditional handicraft in the long history.

2. Artistic aesthetic analysis: Analyze the modeling characteristics, decorative style and color application of copper cast furniture, and discuss how to show the artistic charm of furniture different from other materials through the unique performance of material, form and structure.

3. Technical process analysis: Elaborate the production process, key technologies and material selection of copper casting furniture, understand its process complexity and technical

requirements, and provide technical reference and inspiration for modern furniture designers.

4. Modern integration and innovation: Explore how copper casting process can be combined with modern design concepts and material technology to innovate furniture design ideas, analyze its positioning and development potential in the contemporary furniture market, and provide practical cases for the inheritance and innovation of traditional processes.

5. Cultural value assessment: Evaluate the cultural connotation and social value of copper cast furniture, investigate its role in carrying forward national culture, promoting cultural exchanges, and its contribution to improving the quality of life and enhancing environmental aesthetics.

In order to achieve the above research purposes, the following comprehensive research methods will be adopted in this study:

1. Literature review method: Extensive collection of domestic and foreign historical documents, academic papers and art reviews on copper casting process and furniture design, systematic sorting and induction, and construction of research framework and theoretical basis.

2. Field investigation and case analysis: visited well-known museums, art galleries and handicraft studios at home and abroad, observed copper casting furniture on the spot, selected typical cases for in-depth analysis, and obtained first-hand information.

3. Expert Interview: Invited copper casting process masters, furniture designers and cultural scholars to conduct in-depth interviews, obtain professional insights and experience sharing, and provide practical guidance and theoretical support for the research.

4. Experimental design and production: If conditions permit, try to design and make small copper cast furniture samples, verify the accuracy of theoretical analysis through practice, and explore the possibility of technological innovation.

5. Comprehensive analysis method: Using multidisciplinary theories such as aesthetics, design and material science, the collected data are comprehensively analyzed, and the artistic characteristics, technical points and cultural values of copper casting furniture are extracted to provide a scientific basis for the formation of research conclusions.

Through the comprehensive application of the above research methods, this research is

expected to fully and deeply reveal the unique charm and broad prospects of copper casting in furniture plastic art.

### **Scope of research**

As an important element in daily life, furniture not only has practical functions, but also carries aesthetic and cultural connotations. In the art design of furniture modeling, the basic concept and elements are the basis of furniture aesthetics. Starting from the basic concept of furniture modeling, this paper will discuss its design elements in detail, especially combined with the process characteristics of copper casting, in order to provide theoretical support for the artistic embodiment of furniture modeling.

## **2. Literature review**

Through the in-depth exploration and analysis of the artistic expression of copper casting in furniture modeling, this study draws a series of important conclusions and makes corresponding contributions to this field.

First of all, the research conclusion shows that copper casting technology with its unique material characteristics and technological advantages, in the furniture plastic arts show extraordinary performance. The malleability, corrosion resistance and good plasticity of copper make the cast furniture have a high degree of freedom in shape shaping. Designers are able to use copper casting technology to create furniture pieces that are both ergonomic and artistic. These furniture not only have practical functions, but also become artworks in the space, enhancing the aesthetic value of the overall environment.

Secondly, the innovation of copper casting furniture in plastic arts is reflected in the integration of tradition and modernity. This study found that many designers, while retaining the traditional charm of copper material, integrate modern design concepts and technical means to create furniture with the characteristics of The Times. These works not only inherit the historical and cultural heritage of copper casting technology, but also show the fashion and avant-garde design style, to meet the contemporary people's dual pursuit of quality of life and cultural connotation.

Moreover, the diversity of copper casting furniture in the plastic arts has also been fully demonstrated. Whether it is simple and smooth lines, or complex and fine patterns, copper casting technology can be perfectly presented. This diversity not only enriches the modeling language of furniture, but also provides designers with more creative inspiration. At the same time, the color and texture of copper casting furniture are also more rich and varied because of its unique casting process, which further enhances the artistic value of furniture.

### **3. Research methods**

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**The effect and conclusion of the questionnaire survey:**

The core concept of this design practice is "combining tradition and modernity, highlighting the beauty of copper art". Copper, as a metal material with a long history, has been widely used in the fields of sculpture, vessels and architecture since ancient times. Its unique color, texture and plasticity make it of high artistic value in furniture design. We aim to reinterpret and excavate the traditional aesthetics of copper materials through modern design concepts and technical means, and create furniture works that meet contemporary aesthetic needs without losing classical charm.

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This study not only fills the gap in the field in theory, but also provides useful reference for designers and manufacturers in practice. By systematically combing and analyzing the modeling characteristics, artistic style and production process of copper cast furniture, this study provides designers with more design ideas and innovative directions, and helps to promote the wide application and development of copper cast furniture in the design field.

In addition, this study also discusses the value and significance of copper casting furniture from the perspective of cultural inheritance. As one of the traditional Chinese handicrafts, copper casting carries rich historical culture and national memory. By applying it to furniture design, we can not only inherit and carry forward this traditional craft, but also inject new cultural connotation and artistic charm into modern furniture design

## **Copper analysis**

The design elements of furniture modeling mainly include lines, shapes, proportions, colors and materials. These elements interact and together determine the appearance and style of the furniture.

1. Line: Line is one of the most important modeling elements in furniture design. It can change the contours and appearance of objects, thus affecting people's feelings about furniture. For example, modern style furniture usually uses simple straight lines, showing a simple, bright feeling; The European-style furniture pays more attention to the use of curved lines, showing a gorgeous and noble temperament. Copper casting process has a unique advantage in line performance, which can achieve complex curves and fine contours through casting technology.

2. Shape: Shape is another important modeling element in furniture design. Different shapes can show different functions and styles. For example, a round or oval table is better for group dining, while a rectangular table is better for working or studying. Copper casting furniture in the shape design can make full use of the plasticity and strength of the metal to create a unique shape.

3. Proportion: Proportion refers to the proportion relationship between various parts of the furniture, such as length, width, height, etc. The right proportion relationship can make the furniture look more harmonious and comfortable. In copper casting furniture, the design of the proportion needs to take into account the weight sense and visual effect of the metal material to achieve the overall balance and beauty.

4. Color: Color is another important modeling element in furniture design. Different colors can show different emotions and styles. Copper casting furniture usually has the unique luster and color of metal, and this natural metal texture can add the texture and beauty of the furniture.

5. Material: Material is the key factor in determining the texture and touch of furniture design. As a precious metal material, copper has a unique texture and touch, which can give furniture a noble and elegant temperament. At the same time, the durability and corrosion resistance of copper casting furniture is also an important embodiment of its material advantages.

### **Application analysis of Copper**

1. The drawing of natural inspiration: form and color in nature are endless sources of design inspiration. We deeply explore the curves, texture changes and light effects of nature, and strive to integrate these natural elements into the design of copper cast furniture, so that the furniture is more visually vivid and harmonious, while giving it a simple but elegant temperament.

2. Integration of humanistic feelings: furniture is not only a practical item, but also a carrier of culture. We dig deep into the symbols, patterns and stories in traditional Chinese culture, such as the animal face pattern and cloud thunder pattern on the bronze ware, deconstruct and restructure them through modern design techniques, so that they can be coordinated with the modern home environment, and convey the profound humanistic feelings and the spirit of The Times.

3. Combination of technology and art: copper casting technology has a long history and exquisite skills. We make full use of modern casting technology, such as precision casting, lost

wax method, combined with hand grinding, coloring and other processes, and strive to retain the natural beauty of copper, while improving the fineness and durability of furniture. At the same time, through innovative design techniques, such as modular design, variable design, etc., enhance the functionality and interest of furniture.



Figure 1: xiaohongshu, *Bronze Furniture* by Liu Hongling

4. Sustainability and environmental considerations: In the design process, we also pay attention to the sustainable use of materials and environmental protection, explore the recycling of copper materials, reduce resource waste, and ensure that the design works show artistic beauty, but also in line with the development trend of green design.



Figure 2: xiaohongshu, *Bronze Furniture* by Liu Hongling

To sum up, the design concept and concept of the design practice of copper casting furniture is the courage to innovate on the basis of respecting tradition, through the dual inspiration of nature and humanity, combined with modern science and technology and environmental protection concepts, aiming to create copper art furniture with deep cultural heritage and in line with the needs of modern life, bringing new perspectives and possibilities to the field of furniture design.



Figure 3: Xiaohongshu, *Bronze Furniture* by Liu Hongling

#### **4. Research results and discussion**

Although this study tries to comprehensively and deeply explore the artistic expression of copper casting in furniture modeling, there are still some shortcomings, which need to be improved and perfected in future research.

First of all, although the case selection of this study covers copper cast furniture of multiple periods and styles, the breadth and depth of the selected cases are still to be expanded due to the availability of data and the limitation of research time. Especially for some remote

areas or niche style of copper casting furniture, this study failed to give sufficient attention and discussion, which may lead to the universality and applicability of the research conclusions are affected.

Secondly, in terms of the combination of copper casting technology and furniture plastic art, this study has carried out a more detailed analysis, but it has not deeply discussed the limitations and effects of copper casting technology on furniture plastic art. For example, defects such as deformation and bubbles that may occur in the copper casting process, as well as the limitations of the casting process on the size and complexity of furniture design, are of great significance in practical applications, but they are not fully discussed in this study.

In addition, this study also has shortcomings in the market acceptance of copper casting furniture and consumer psychological analysis. With the continuous change of people's aesthetic concepts and lifestyles, the market demand and consumer psychology of copper casting furniture are also constantly changing. This study fails to make an in-depth analysis and prediction of these changes, thus failing to provide more specific market guidance for the design and production of copper casting furniture.

In view of the above research deficiencies, future research can be expanded and deepened from the following aspects:

First of all, the breadth and depth of case selection should be further expanded, and the research on copper casting furniture in remote areas or minority styles should be strengthened, so as to enrich and improve the plastic art system of copper casting furniture. At the same time, more interdisciplinary research methods, such as sociology and psychology, can be introduced to more comprehensively explore the artistic embodiment of copper cast furniture in different cultural and social backgrounds.

Secondly, the limitations and influences of copper casting technology on furniture plastic art should be deeply discussed, and more specific technical guidance and suggestions should be provided for designers. For example, we can study how to reduce defects by improving the casting process, and how to overcome the limitations of the casting process on the size and complexity of furniture design through design innovation.

In addition, future research should also strengthen the market acceptance of copper casting furniture and consumer psychology analysis. The opinions and suggestions of consumers can be collected through questionnaires, interviews and other methods to understand their aesthetic needs and experience of copper casting furniture, so as to provide designers with more accurate market positioning and design direction.

To sum up, the artistic representation of copper casting in furniture modeling is a complex and challenging research field. Future research should continue to deepen the discussion in this field, and provide more comprehensive and specific guidance for the design and production of copper casting furniture.

## **5. Conclusion**

To sum up, through the in-depth exploration of the artistic expression of copper casting in furniture modeling, this study concluded that copper casting furniture has significant advantages in expressive force, innovation, diversity and cultural inheritance. These conclusions not only enrich the theoretical system in the field of furniture design, but also provide valuable practical guidance for designers and manufacturers, and make positive contributions to promote the continuous development and innovation of the art of copper casting furniture.

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### **Suggestions**

1. Upgrading of consumer demand: Modern consumers are paying more and more attention to the personalization, environmental protection and durability of furniture. Copper casting furniture with its durable, easy to clean and maintain and environmental protection properties, gradually become the new darling of the market. Especially in the high-end furniture market, copper cast furniture is deeply loved by consumers because of its unique texture and artistic value.

2. Wide range of application scenarios: The application scenarios of copper casting furniture are very wide, from family living space to commercial exhibition places, and then to public places, you can see its figure. In the family living space, copper cast furniture can be used as an ornament to enhance the style and texture of the overall space; In the commercial exhibition place, copper casting furniture can highlight the high-end positioning and artistic taste of the brand.

3. Intelligent development: With the progress of science and technology, intelligence has become an important development trend in the furniture industry. Copper casting furniture is no exception, through the introduction of intelligent technology, such as intelligent induction, intelligent control, etc., can further enhance the practicality and convenience of furniture, to meet consumers' pursuit of high-quality life.

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