Expression Forms and Application of Ceramic Materials in Mural Paintings in Architectural Environment

Lei Baojie¹, Kim Chul Soo²

¹Henan Institute of Science and Technology, Dept. of Industrial Design, Pukyong National University
²Dept. of Industrial Design, Pukyong National University

Abstract. With increasing humanistic spirit, health concepts and environmental awareness in human beings, ceramic materials, with its strength, are increasingly applied in murals in architectures. As innovative breakthroughs are constantly taking place in terms of ceramic materials and workmanship, greater satisfaction of people’s aesthetic needs for architectural environmental decoration are being realized. Focusing on the expression forms of ceramic materials in architectural murals, the paper analyses the practical application of modern ceramic materials in architectural murals from the perspective of color and texture. The paper also explores the innovative development of ceramic murals in hope of promoting the application of ceramic materials in relevant fields.

1. Introduction

Traditional ceramics are made by smashing, mixing, moulding, and high-temperature calcination of clay and natural minerals. Environmentally friendly and non-toxic, such materials have the features of high hardness, colorfastness, moisture resistance, and corrosion resistance with no deformation. In fact, knowledge of the expression forms, technological processes of ceramic murals and their compatibility with the architectural environmental is necessary for the study of ceramic materials in architectural murals.

2. Expression forms of ceramic materials in architectural murals

Ceramic materials have complex process techniques and a great number of expression forms when applied in architectural murals. The selection of ceramic materials may vary according to different requirements of concrete architectural environments. The major expression categories of ceramic murals include overglazed color, underglazed color, tri-color pottery of the Tang Dynasty, fancy glaze, embossed form, and composite materials.[1]

Table 1. Properties Comparison of Different Expression Forms of Ceramic Murals.

| Variety                        | Calcination Temperature | Features of Glaze Color       | Suitable Space       |
|--------------------------------|-------------------------|-------------------------------|---------------------|
| Overglazed Color               | 720~800(9)°C            | Stable, Bright-colored        | Interior, Exterior  |
| Underglazed Color              | 1230~1260°C             | Simple, Classic               | Exterior            |
| Tri-colored Pottery in the Tang Dynasty | 900°C                 | Bright-colored, Florid        | Interior            |
| Fancy Glaze                    | 1200~1300°C             | Profound, Antique             | Interior, Exterior  |
| Embossed                       | 1300°C                  | Antique, Monolithic           | Exterior            |
2.1. Overglazed color murals
Overglazed color murals are painted on ceramic plates or tiles with specially made pigments, low temperature ceramic pigments and diluting agents. Using simple calcination method, overglazed color decoration has stable performance, rich, steady and vigorous color expression. Varied expression techniques such as sketching contours, dotting stroke, chapped stroke, chopping, dyeing, and brushing can render a vivid and fascinating image. Overglazed color murals are the major expression forms of architectural murals.

2.2. Underglazed color murals
Painting mineral pigments on a green body or unglazed ware, using traditional workmanship, underglazed drawings are performed on the semi-finished goods. With application of transparent glaze, underglazed color decoration is made after high-temperature calcination. More endurable than overglazed color, underglazed color figure is bright, classic and monolithic. With sparkling and wet color surface, it features as corrosion resistant, wear resistant, environmental friendly, non-toxic and easy to clean. Underglazed color decoration has higher requirements on technological processes, and is thus more suitable for small-size architectural murals.

2.3. Tri-colored glazed murals with the tang dynasty style
Tri-color pottery of the Tang Dynasty is made by direct painting with pigments of multiple color low temperature glaze on unglazed wares before low temperature calcination. With time-honored workmanship, it is increasingly becoming a creative form of ceramic murals. Traditional tri-color glazed pottery of the Tang Dynasty mainly exhibits itself in a three-colored glaze, i.e. yellow, green and brown. Modern tri-color glazed pottery of the Tang Dynasty style is formulated by using colored painting bounded by lead powder. With plain color and natural furnace transmutation, it has simple and unadorned beauty.

2.4. Fancy glaze murals
Fancy glaze is manufactured by high temperature calcination using high temperature color glaze as pigments. Wonderful artistic effects can be produced through the inter-infiltration of colored glazes during the high temperature calcination. With fascinating and varied transmutation, monolithic glaze color, antique style, mysterious beauty and harmonious artistic features, fancy glaze are increasingly becoming a popular ceramic mural material.

2.5. Embossed ceramic murals
Embosed ceramic murals have the features such as good overall effect with clear distinction and stereoscopic impression. Embossed murals on unglazed wares have been quite popular since recent years. No glazes are applied on the ware in this way to protect the unadorned feature. Shoveling, chopping and hollow engraving by using sweep blade, slanting knives and blunt shovel are performed on the unpainted clay body to produce plain, uncomplicated, monolithic and powerful charm.

2.6. Comprehensive decorative ceramic murals
Comprehensive decorative ceramic murals are a particular form that employs multiple ceramic expression techniques for artistic representation. For example, the ceramic mural that combines overglazed color figure with high temperature fancy glaze, or underglazed color figure with embossed form.
In terms of the workmanship, comprehensive ceramic murals are an innovative integrated expression form that draws upon the strength of each type of ceramic murals to avoid the usage of single technique and material.[2]

3. Analysis of ceramic materials’ application in architectural murals
3.1. Application of colors
The colors of ceramic murals are rich and varied, with different glaze colors to reflect different color
styles. The rich glaze color is the unique quality of ceramic murals. In the process of calcination, the mysterious glaze color reflects a unique artistic beauty. The glaze color produces unique artistic charm in the furnace, which endows the cold and bland building environment with emotional touch. The fancy change of glaze color of ceramic murals, blended with the architectural environment, evokes the resonance of people’s hearts. This emotional color touches the human mind, and exudes a natural and mysterious artistic atmosphere, which naturally arouses people’s aesthetic interest. While it touches a chord in human heart, it also paves the way for a broader development of architectural environment.

Between 1957 and 1959, Joan Miró created two earthenware glazed murals called “Wall of the Moon” and “Wall of the Sun” for the UNESCO building in Paris (figure 1) (figure 2). The two pieces are characterized by the unique charm of ceramic glaze, with abstract shapes and bright colors, which renders strong yet soft visual effect of the picture. The works are filled with the sense of freedom and innocence, which gives people fancy feelings and highlights the yearning for freedom and peace. The beauty of nature and harmony is revealed, and the color style of the works is in harmony with the UNESCO architectural environment.

3.2. Application of texture
The texture of ceramic murals is characterized by unevenness, criss-crossing, rough and smooth texture structure, which reproduces rich and varied mural features as well as changing visual effect. The texture of ceramic art is diverse due to factors such as glaze color, clay, shape and craftsmanship. Artists take advantage of the characteristics of ceramic materials in the production process, using techniques including tapping, carving, embossing, scribing, and pinching, so as to realize a variety of texture effects. [3]

The ceramic mural work “Dongping River Catalogue” in the Shiwan Ceramics Museum in Guangdong uses the stacking method (figure 3) to carry out hand-moulding and embossed decoration on clay mud, which realized lively and vivid textures of the characters and landscapes.

Repetitive pasting of single piece of clay is adopted in the ceramic mural named “A Gentle Breeze” in Shanghai Pudong Airport (figure 4), forming a rhythmic texture effect full of modern flavor.

3.3. Material application
Ceramic murals involve artistic processing of clay materials through special workmanship, so as to serve the architectural environment with the artistic beauty of ceramic materials. The properties of ceramics are unmatched by other mural materials.
“River of Life”, created by Chinese potter Zhu Legeng, uses clay as material to recreate the lines of life and rhythm for modern urban space. Ceramic materials that are usually static in the traditional art are changed into a myriad of rhythmic ceramic lines in the mural. Many flowers form a flowing ceramic river, reflecting the beauty of ceramic materials (figure 6). In another ceramic mural by Zhu Legeng called “A Book from Heaven”, clay was fully employed through kneading and tapping to form a natural crack, making the mural natural and monolithic. The wrinkles of the mud pieces and the cracks formed through furnace transmutation make the mural painting seemingly relaxed and free, more vividly expressing the theme.

3.4. Application of comprehensive materials
With the rapid development of ceramic art workmanship, ceramic mural materials, coupled with their special features in quality, color and texture, are increasingly being used with other materials to form a new mural expression form that produces original and harmonious artistic effect. The integrated use of different materials has created a new artistic beauty of ceramics, brought new vitality to ceramic murals and haven been increasingly satisfying people’s aesthetic requirements for ceramic murals.

Glass material workmanship was applied on the ceramic plate of a glass embossed ceramic mural work called “Water Splashing Folk Customs”, which makes the mural style simple and beautiful, reflecting the distinct ethnic style (figure 9). The marble ceramic embossed mural work named “Now and the Future” uses marble and ceramic, two different materials, to produce a layered, dynamic and powerful visual effect (figure 10). The glass ball mosaic ceramic mural entitled “Unlimited” was made by pasting glass balls on the surface of ceramic mosaic wall, rendering vigorous and splendid design (figure 11).

In summary, with particular artistic characteristics, ceramic murals can serve as a unique form in the architectural environment, in which the characteristics of color, texture and material play an important role in the formation of ceramic mural style. Making full use of the influencing factors of ceramic materials in the design of architectural murals can create impressive mural paintings with artistic beauty.

4. Prospect of ceramic materials’ application in architectural murals
With rapid social and economic development, and the improvement of people’s ideological and cultural standards, diversified development trend is taking place in the field of ceramic murals.
Modern ceramic materials have developed rapidly along with the advancement of architectural mural art. On the basis of ceramic media, artists have created art works with greater modern aesthetic awareness. Ceramic mural creation participates in architectural design with active openness and becomes an important artistic carrier in environmental art. In the future application of ceramic materials in architectural environment, the following aspects should be emphasized.

First, people are constantly pursuing the optimization of urban environment and creating a quiet, harmonious and relaxed living space. This requires ceramic mural artists to keep up with the development of the times, constantly adapt to people’s new aesthetic viewpoints, and make ceramic material murals fashionable and relatively endurable. Second, with the changes and development of ceramic mural materials, artists need to constantly explore the potential of such materials, introduce new workmanship and new technologies, and better grasp the expression language and characteristics of ceramics. Third, while maintaining the characteristics of local culture, the study and exchange of international mural art should be strengthened to integrate advanced design concepts and techniques, and promote the rapid development of ceramic murals.[4]

5. Conclusion
As ceramic mural materials boast high adaptability to surrounding environment and have close affinity to nature, many architects have begun to adopt such materials as a way to pursue and express their understanding about beauty. Ceramic materials used in architectural murals are environmentally and ecologically friendly, and are easy to clean, waterproof, fireproof, anti-corrosive, and anti-oxidant. These advantages represent the unique artistic charm of architectural murals. Ceramic murals can effectively decorate the physical space through the expressions of color, shape, and texture, and can enhance the cultural and artistic atmosphere of the entire architectural environment. The permanence, affinity, contingency and aesthetics of ceramic murals make it unique in the architectural environment. Used in public space mural paintings, modern ceramic materials play an important role in architectural environment, as they can turn architectural space into a distinctive and ideal medium for human interaction in artistic life. With the boom in modern urban architecture and the evolvement of the idea “living in art”, ceramic mural materials will be applied extensively in modern architectural space, and become the driving force behind the fusion of artistic life and architectural techniques.

Reference
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