Analysis on the Application of Modern Building Exterior Wall Materials in Interior Design

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Abstract. Analyze materials from the perspective of the application of new modern building exterior wall materials, especially the technical value and aesthetic value of plastic materials and ceramic tile materials applications, as well as the close connection between materials, technology and art in interior design. Interior design is a comprehensive project that combines technology and art, not only requires a standard design implementation process, but also the pursuit of creative and imaginative design concepts and connotations. Because materials are the only medium, interior design materials that combine design techniques and design art are used to support design. The development of new materials is not only a huge advancement in the use of materials, but also promotes the innovation of interior design, and promotes the advancement of ideas and technology.

1. Overview of new modern building exterior wall materials

In a broad sense, materials are a general term for substances used in interior design. They are not bound by color, material, or form. The macroscopic material properties of the world, such as the microscopic angle of color, hardness, melting point, odor or material composition, and the structure, such as the internal design of the material, are all considered together. At the same time, innovation in design materials can advance the innovation of design concepts. The requirements of interior design for practical functions and art design are very strict, so the pursuit of material performance in interior design is unlimited, and innovative materials are the material attributes pursued by indoor instruments. New and modern building exterior wall materials are a huge advancement in modern materials science, and innovation in materials in related fields has undoubtedly promoted industrial innovation.

The development of building materials depends on the development of the building, from which the development of materials can be seen. For example, the Museum of De La Merda in Italy is located in the Castelbosco dairy farm in the province of Piacenza in northern Italy. There are 2,500 cows that produce 30,000 kilograms of milk and 100,000 kilograms of manure. Because of the amount of manure, the dairy farm owner thought of waste utilization: he got methane from cow dung that could be used to burn energy. These manures are also converted into building materials such as stucco or brick (Figure 1).

The Taipei Ark (Acoark Pavilion) is made up of plastic bottles connected to each other. The plastic bottles made of recycled PET plastic (polyethylene is phenylvalerate) are commonly called plastic bottle bricks. The Ark, built in a treasure bottle, is not only structurally stable, it is also resistant to earthquakes
and typhoons, and it is also very environmentally friendly. More importantly, the cost is very low. Plastic bottle bricks (Fig. 2) are blow molded on the construction site with crushed PET plastic material (i.e., the composition of the plastic water bottle), and then the rectangular plates are stacked without chemical adhesive.

Figure 1. Cotta.  
Figure 2. Baote bottle brick.

Whether it is the fecal derivative of the Italian Museum or the bottle of the Ark. They all present their thoughts on the relationship between nature, energy, people and the world in the form of art. It can be seen that beauty and science meet, and humans and animals, modernity and heavy history are intertwined. The new modern building exterior wall material reflects the reuse of energy and the protection of the environment.

2. The impact of new modern building exterior wall materials on interior design

The leap of modern science and technology has brought a wealth of design materials to the interior design of the architectural field. Terracotta bricks and plastic materials are one of the important new materials. Especially after entering the new century, terracotta bricks and plastics have played an increasingly important role in promoting the progress of the building materials industry. Under the popularization of ecological and environmental protection ideas, terracotta bricks and plastics have become the materials of choice for interior design under the green design concept based on their own synthetic potential.

Based on the two main applications of terracotta brick and plastic technology in interior design, the first is the decoration of the interior design of the material. The following is based on the excellent properties of the material and the design process or technology, which is widely used in interior design. From the influence surface, the technology of the material represented by the former has a very small influence on the interior design, which is reflected in the simple and limited decorative effect of the material product; The latter design technology based on the special characteristics of materials, from the principles and theories of interior design, influences the interior design from the fundamental aspects of color composition, spatial pattern, design style and green ecology. The following is mainly about the impact of the use of materials technology on interior design from three main aspects: interior space, design style, and green ecology.

2.1. Influence of new modern building exterior wall materials on indoor space

When Interior design is an artistic expression that cannot be achieved by simple decorative furnishings. The division of spatial pattern is the basic carrier of artistic display. In general, due to the limitations of the building structure, the interior design of the spatial space pattern is very limited, so attention is paid to the exterior surface decoration design. With the emergence of new materials and new technologies, architects can overcome the constraints of building structures on interior space design. Starting from the middle of the 20th century, based on the popularity of reinforced concrete frames, steel structures and polymer materials in the field of construction engineering, in the spatial pattern design of technological innovation period, the flow space technology based on new materials is prominent. It brings a revolutionary interior design idea, interior design is no longer limited to the decoration of the building
surface, from the overall spatial pattern of the design concept to the development of modern interior design. Since the 21st century, the rapid development of industrial synthesis technology of terracotta bricks and plastic materials has promoted the innovation of interior design technology and design ideas. This material revolutionizes traditional space packaging technology with a spatial style of technology and highlights the overall and fluidity of the spatial landscape. The variety and agility of the spatial curve exhibited by the material perfectly combines the technical and artistic aspects of interior design. The excellent plasticity and easy processing characteristics of the material make it an important support for the interior design innovation research on spatial pattern.

2.2. Influence of new modern building exterior wall materials on interior design style
In terms of interior style, the texture and color composition of the material itself is an important aspect of the design art. The synthetic principle of terracotta bricks and plastic materials gives them inherent flexibility and richness in color performance and texture performance. Modern interior design is increasingly pursuing simplicity, fashion, comfort, practicality and environmental protection. Therefore, the traditional decorative design concept has been eliminated. On the basis of practical advanced design technology and new materials, the duality of practical and aesthetic needs is revealed. In the diversified environment of the world, only a wide variety of materials with varying performance and applicability can meet the diversified development of interior design. Among them, the composite material technology based on terracotta bricks and plastic materials is the innovative research direction of the design concept. The Centre Pompidou in Paris is a reflection of the high-tech and new materials composite application model, in interior design, it uses a lot of high-strength steel, such as plastic, hard aluminum. New materials, integrated architectural features are considered throughout the interior art design, the overall style of practical design, based on new materials technology will use the needs and art.

2.3. The impact of new modern building exterior wall materials on indoor green ecology
The development of new materials for the foundation of interior decoration materials can make full use of the texture features to make a reasonable combination of different materials, so as to obtain different types of artistic effects. People's choice of materials has become so compromised that they break stereotypes and try to apply new materials. According to the material requirements of the interior design, the choice of material design requires both good performance and coordination with the material environment, ie green material or environmental coordination. In the 21st century, the slogan of "energy saving and environmental protection" is advocated to promote the sustainable development of society. Interior design should also advocate design ideas that are not wasted with the trend of the times, and moderate consumption. Utilize all natural conditions to minimize the consumption of natural resources, energy, raw material design should select materials that can be reused, easily disassembled, renewable, non-polluting, and non-toxic. Maximize manpower, material resources and financial resources. Green materials mainly refer to raw materials used for production, until the complete cycle of waste of resources, minimum energy consumption and pollutant emissions, and the least pollution to the environment and human body. Green environmentally friendly materials can first save natural resources and energy, prevent environmental pollution, recycle, and establish a good recycling system. There are also advanced green technologies such as solar water heating technology, solar greenhouse technology, recycled wallpaper, and flame retardant. The rational use of these green materials during interior decoration can reflect a simple, natural and healthy lifestyle.

3. Overview of the application of new modern building exterior wall materials in interior design
The division of the historical period of human civilization is more representative of the historical period based on the materials used in the production of material data. It can be seen that the material is a direct reflection of the production level of material data and production technology. In the history of architectural engineering, due to the difference between Eastern and Western materials, two different styles of architectural style, wood construction and stone architecture have been formed, and different
styles of interior design have been developed accordingly. The Eastern civilization uses wood as the foundation of building materials, and the wooden structural frame is used for architectural interior design and decoration. Then, based on the interior decoration design, the beam system is gradually transformed, such as partitions, screens, frames, frame design, etc., and wooden materials. Based on the machinability, Dongfeng architectural design variables, good at art and the pursuit of nature, such as interior design style. Western civilizations are mostly based on stone materials, and gradually form two main design elements: column and arch. And based on the thick sense of stone materials and unique processing characteristics, the fusion of architecture and sculpture technology and related engraving techniques have become the main design means of Western architectural decoration. The heavy and exquisite carving art is a typical art design style of Western architecture. It can be seen that the interior design in the field of architecture is to unify the practicality and artistry of architectural design through materials. From some perspectives, materials determine the direction of construction and interior design techniques, and also determine the artistic style of the design. For materials, the development of material-based architectural design and interior design also reflects the distinctive characteristics of the times.

Terracotta bricks have long been used in a large number of architectural facades. But looking back at the domestic interior design market at the end of the last century, the dominant is still the smooth texture of the tiles. With the development of the economy, people's aesthetic tastes have changed. Until the beginning of this century, terracotta bricks began to apply interior design in China. Today's mud brick market, a large number of factories, also produced ceramic tiles with their own characteristics. In different units, a variety of splicing, various textures and textures of terracotta bricks, greatly enriched the clay bricks, it offers a wide range of options for a variety of interiors. It can be applied to various interior design projects with different functional requirements. In the case of more and more forms, the application mode of ceramic tiles in interior design is still relatively simple. Its application mode is nothing more than two types. One: attached to the wall, the skin of the wall, giving the wall a special texture. Second: paving on the ground. In these two modes, the former pays more attention to the decorative nature, so the basic elements such as the shape and size, the splicing method, and the material texture of the terracotta brick used for the wall are extremely varied. The terracotta bricks used for the ground are relatively simple in terms of practicability, and the form changes are relatively simple.

In contemporary interior design, the role of terracotta tiles is "skin", which is attached to the wall and the ground. It is not fully involved in the shaping of interior spaces, in order to develop the clay bricks, it is necessary to break through its original application mode, and it is possible to emerge with a new look and renew its vitality.

Jing Zhao Yin restaurant interior design. Zhang Yonghe particularly likes the Beijing quadrangle. Its design concept inherits the "harmony" architectural tradition, and boldly renovates the elements such as tiles, bricks, wood, and hemp. For example, repositioning, presenting a unique atmosphere of Chinese and Western, natural and elegant. The suspended octahedral screen creates an intimate space. A large number of ceramic tiles are used as partitions, screens, and floor tiles. (Figure 3)
For example, the Aspris Cafe project uses light steel keel suspension technology to build ceramic tiles. Not only stabilized the wall, but also beautified the decoration, lighting, ventilation and other functions of the wall. (Figure 4)

Another example is the Vietnam Termite Cave Residential Project, which uses double-layered glass bricks for "double skin" construction. The double skin system forms an air cavity that responds to extreme tropical climate changes in Vietnam. At the same time, the epidermis forms a fascinating light and shadow effect (Figure 5). The "double skin" construction technology uses exterior bricks, the interior uses an aluminum frame glass curtain wall to create a space between the walls as a buffer between the two walls.

Figure 5. Double-layer skin system of Vietnamese termite cave house

Combining traditional brick crafts with modern computer technology, a unique surface texture is formed by a variety of different masonry methods. This style of practice reflects the richness of traditional material language under modern technology. For example, the Beijing Tongzhou Art Center project combines modern technology with traditional craftsmanship. The participation of computer-aided design in the design process gives a new form of traditional brick. The brick wall of this project has no structural effect, and the brick not only does not bear the weight, but also requires additional construction to fix it. Behind the cantilevered top brick skin, there is a special rigid keel with a bayonet as the structure of the hanging brick. Traditionally, bricks that can only be used as facade walls and floor materials appear on the ceiling, completely subverting traditional architectural vocabulary. This is not for the pursuit of material purity, nor for aesthetic taste, but for the new possibilities of bricks that show the involvement of contemporary technology (Figure 6, Figure 7). Taking this as an example, this method is also the decoration of the indoor part interface.

Figure 6. Beijing Tongzhou Art Center. Figure 7. Data model of the wall effect.

The clay is very rich in texture, with a natural color, bright and clear tones, and easy to control color. You can prepare colors as needed. It is an original natural material that blends into traditional Chinese culture. The combination of traditional materials and modern architecture has a unique artistic charm. The texture of ceramic tiles, ceramic plates and ceramic tiles is more delicate, the color is more stable and more vivid. For example, the performance is superior, and the improvement people know, as a new type of environmentally friendly and lightweight building decoration material, clay materials have been widely used by architects in exterior decoration projects.
Plastic polymer materials used in floor and wall materials, it is mainly based on the synthetic processing technology of plastic polymer materials, the plastic polymer material has superior proprietary properties when performing interior decoration functions. In addition, plastic polymer materials and material processing technologies based on polymer materials are also widely used in interior furniture and display interior design. For example, the Italian furniture brand Kartel, from the middle of the 20th century, polymer materials entered a new stage of development, the company is boldly using synthetic plastics as the main raw material for its furniture production. The product is characterized by light weight, flexibility, rich color, beautiful appearance and strong artistic expression.

In the field of interior design, new plastic materials and related technologies show their superiority in terms of color and texture, space composition, process, cost and environmental protection, and innovation. As a comprehensive project combining technical and artistic expression, whether the material is used in the initial synthetic processing or in the secondary treatment of the design, both color performance and material performance are easy to implement in humans. For example, color-changing polymer paints can create a dynamic, dreamy color atmosphere in an indoor space. However, in all aspects of the advantages of new plastic materials and technology, the most striking thing is the dramatic changes in the interior space design pattern. Based on a new type of excellent plastic material with strong plasticity, using flexible line design techniques, can break through the limitations of the building space, especially high-strength plastic film technology, due to its own structural strength, easy design, and reasonable economic costs, designed by designers to be used in a variety of expressive interior art designs. It can be seen that the superiority of new plastic materials makes the development of new materials technology more rapid. In the field of interior design, the development of new materials technology has directly promoted the continuous transformation of design ideas.

4. Conclusion

Taking new modern building exterior wall materials as key materials in modern construction projects, the application and analysis of modern new material technologies in interior design plays an important role. The material combination technology based on plastic and terracotta bricks is a new development direction in the field of interior design. In the contemporary era of new technologies and new materials, materials are an important medium for interior design to integrate technology and artistic aesthetics. Especially for modern new materials, in the field of interior design, it has a great impact on the transformation of design ideas, and it has important practical significance for the analysis of its influence, superiority and development trend.

References
[1] Zheng Xiaodong. Shen Anchang. Research on the Use of Traditional Materials in Contemporary Chinese Architecture in the Context of Construction.
[2] M. Gao Shupeng. Application of clay materials in exterior decoration engineering. Building materials technology and application, 2014.
[3] M. Hu Zhiqiang. New construction and decoration materials. Beijing: Chemical Industry Press, 2007. G. R. Mettam, How to prepare an electronic version of your article, in: B.S. Jones, R. Z. Smith (Eds.), Introduction to the Electronic Age, E-Publishing Inc., New York, 1999, pp. 281 - 304.
[4] J. Zhang Awei. Lu Changde. Technical beauty and industrial design. Journal of Northwest Textile Institute, 2000 (4): 19 - 25. P. G. Clem, M. Rodriguez, J. A. Voigt and C. S. Ashley, U. S. Patent 6, 231, 666. (2001).
[5] Xu Wei. "The Application of Clay Bricks in Contemporary Interior Design".
[6] Zhang Yonghe Jing Zhao Yin Restaurant Interior Design.
[7] J. Zhang Li. Aspris Cafe, Tehran, Iran, World Architecture, 2016, 09: 44 - 47.
[8] J. Zhang Li. Termite Cave Residence, Vietnam, World Architecture, 2016, 09: 48 - 52.