

## Application of Nano-ceramic Materials in Lingnan Characteristic Interior Decoration Design

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**Keywords:** Nano-ceramic Materials, Lingnan characteristics, Interior decoration design

**Abstract:** In recent years, nano-ceramic materials have been applied in interior decoration design, which is mainly reflected in the interior wall coating and the use of ceramic materials to decorate the interior space. Due to the high composite and stability of nano-ceramic materials, they have excellent performance in color, size and high temperature environment, so they have a good application space and prospect in the interior decoration of Lingnan characteristic culture. This paper gradually analyzes the application of nano-ceramic materials in Lingnan characteristic interior decoration design from the perspective of the composition and application of nano-ceramic materials, and makes a certain degree of outlook on its development prospect.

### 1. Introduction

The so-called nano-ceramic material is introducing nano-ceramic particles, whiskers, fibers into the ceramic matrix, In the process of implanting the matrix, the structure has undergone major changes. Compared with traditional ceramic materials, not only the color, performance, mechanics, and optics of the ceramic matrix have changed, but also the nano-ceramic material itself has a "special" "Capacity" includes high temperature resistance, as well as the ability to carry out complex shape design, which is unimaginable in traditional ceramic materials. It can be said that this is a new type of composite material with good mechanical properties. This kind of material itself has adaptability and strain ability to different environments, coupled with the easy cutting process in the application process of nano-ceramic materials, and it has better performance in superplasticity. From the perspective of nano-ceramic material, it is a new structured ceramic material with high-tech content developed in recent 20 years <sup>[1]</sup>.

### 2. Application Status of Nano-ceramic Materials

The development of nano-ceramic material has a history of more than 20 years. Its development is inseparable from the development of nanotechnology. It can be said that the development of nanotechnology promotes the development and integration of ceramic materials. As an advanced applied composite material, it is a new type of ceramic composed of nano-level microstructures. Material, it can be said that it satisfies the market's requirements for new materials, especially its microscopic shaping power and aesthetic characteristics, so that it can be applied to the size of the grain size in a highly recognizable space. , And the requirements of grain boundary width, and have outstanding effects on the second phase distribution and multi-level applications. For example, in terms of pore size, nano-ceramic materials can be nano-scale, which means they can be breathable but not The level of water seepage, and at the same time, because it can be invisible to the naked eye, it has a greater breakthrough in the range of defects. From this point of view, it meets the needs of high-end products and also meets the characteristics of Lingnan The requirements of interior decoration design can also meet the needs of other characteristic interior design markets, and there is no obstacle to the strict requirements of designers. At the same time, it is more prominent in the surface and boundary stress surface, making the original ceramics present a diversified, unique performance and visual performance.

Nano-ceramic material is the fastest developing high-tech material in the world. In terms of type, it has developed from single-phase ceramic technology to multi-phase composite ceramics, and from micron-ceramic composite materials to nano-ceramic composite materials. With the development of nano technology, the functions of nano-ceramic materials reflect more characteristics, such as in structural materials, it has better high temperature resistance. In the surface of the aesthetic, it reflects more delicate technical characteristics and visualization features.

As the material reaches the nanometer level, the strength, toughness and temperature resistance, especially super plasticity of the material greatly improve the application space and scope. Especially compared with the traditional engineering ceramics, the original shortcomings are solved by the nano materials. The application of nano-ceramic materials, which make important changes in the mechanical, electrical, thermal, magnetic and optical properties of materials, also face new opportunities for the development of interior decoration.

### **3. Application Analysis of Nano-ceramic Materials in Lingnan Characteristic Interior Decoration**

#### **3.1 Analysis of Application Scope of Nano-ceramic Materials in Lingnan Characteristic Interior Decoration**

Because some shapes and styles with Lingnan cultural characteristics are widely used in the interior decoration with Lingnan characteristics, and because Lingnan culture has a far-reaching influence, it touches the Guangdong and Guangxi regions and has a large audience, the design formed in the long-term historical evolution. With the advent of the era of nano-ceramic materials, the style will inevitably undergo major changes. This change itself is a change in art by technology, and it is also due to the need for art to find modern elements in a larger space. The characteristic patterns of Lingnan have always been incapable of being reflected by traditional ceramic materials. Because this kind of manifestation requires extremely high-definition images to show the exquisiteness and beauty of the patterns themselves, nano-ceramic materials have a greater imagination and application at this point. space Lingnan characteristic interior decoration design elements are mainly reflected in Lingnan architecture, garden, culture and art. These spaces have higher requirements for materials. For example, the architectural structure and materials, modeling and spatial pattern, symbols and colors of Lingnan have a huge space for nano-ceramic materials to play. In addition, the gardening techniques of Lingnan gardens often include windows near plantains, moon-shaped doors, green bricks and whitewalls, corridors, boats and implicates. These decorative elements of Lingnan will also be applied to interior decoration, so in the scope of application, especially in space ceramic decoration, as well as home design, to create a unique combination of modern and retro interior design style has better effect.

#### **3.2 Analysis of Application Objects of Nano-ceramic Materials in Lingnan Characteristic Interior Decoration**

As Lingnan's characteristic interior decoration design is for the object, or for the designer, the more objects are applied, the better, which can reflect more creative and innovative elements, especially in nano-ceramic materials due to its crystals. The nano-level characteristics of the size itself can be reflected in any ceramic product, and it can also be implanted into different application objects. For example, nano-ceramic materials can be implanted into wood or into walls. For nano-ceramic materials, due to their special capabilities and functions, they play an important role in Lingnan's characteristic interior design, and play a major role in the formation of Lingnan's characteristic style, especially in the home interior design divided into several functional areas ,Nano-ceramic materials often play a role in separating zones,In the application of ceramic products, nano-ceramic materials often play an important role of affecting the interior style. Especially in the interior design divided into several functional areas, nano-ceramic materials often play the role of partition, such as from the entrance to the living room and dining room, there will be some color changes. Kitchen and bathroom have different requirements for temperature, and the

bedroom and study have higher optical requirements. In children's room, magnetic requirements and environmental protection requirements will be higher. Therefore, there are different application value and object distinction in different regional design. For example, in the porch, nano-ceramic materials are used to decorate windows and green bricks in Lingnan style decoration. The transition space between the porch and the living room is distinguished by different patterns. This is the characteristic of nano-ceramic materials, which can make more complex patterns<sup>[2]</sup>.

### **3.3 Analysis on the Integration of Traditional Methods of Lingnan Characteristic Interior Decoration Design and the Application of Nano-ceramic Materials**

Lingnan characteristic interior design has excellent traditional techniques, At the same time, it is also the optimization and sublimation of nano-ceramic materials, and the superior traditional methods cannot be denied in Lingnan's characteristic interior design, such as gray plastic, pottery, brick carving, wood carving, cave doors and windows, empty flowers and ancient paintings, floor paving, and color Glass, mosaic murals, several bonsai frames, characteristic furniture, plaque couplets, etc., these traditional methods cannot be changed by the application of nano-ceramic materials, but must integrate this traditional and modern methods and materials from a deeper level. Different experiences in the application form a new discipline system. In the Lingnan characteristic interior decoration design, we can feel the cultural diversity and the compatible needs of the cultural carrier itself. Therefore, from this perspective, we need to carry out the current traditional methods. The fusion of technology and art, and the use of nano-ceramic materials will inevitably make the indoor landscape dazzling and beautiful, and more comprehensively reflect the uniqueness of Lingnan's interior design. Therefore, better combining nano-ceramic materials with Lingnan interior design can better reflect its characteristics and make Lingnan interior design more forward-looking and meaningful. Therefore, we must firmly grasp this point in the application of nano-ceramic materials, that is to integrate nano-ceramic materials with Lingnan characteristic interior design, so as to have better performance.

## **4. Prospect of Nano-ceramic Materials in Lingnan Interior Decoration**

### **4.1 Excellent Mechanical Properties Ensure Its Application Range**

The mechanical properties of nano-ceramic materials are required to be higher in Lingnan characteristic interior decoration, so the mechanical properties of nano-ceramic materials still have great room for improvement with the deepening of research and product optimization. It is not easy to fracture under some bearing forces, and there is a greater room to improve the fracture toughness, especially to meet the development needs of some special structures. There is also a larger improvement space of the high temperature resistant performance. In addition, the hardness, elastic modulus and coefficient of thermal expansion of nano-ceramic materials are excellent, so it has a good living space in the future application. Although there are still many key technologies to be solved, nano-ceramics have broad application prospects due to the excellent mechanical properties.

### **4.2 Good Optical Performance Reflects More Modern and Technological Sense**

Optical properties are often neglected in many materials. This is because they do not require optical processing in the "special design". Optical properties are a very important part of the characteristic interior design. It reflects the environment and human Fusion embodies the tension represented and expressed by art. With the continuous development of science and technology of nano-ceramic materials, some interior design should emphasize stealth technology, that is, using nano-ceramic materials as one of the ways to achieve stealth technology. The role of absorbing technology is also considered. However, from the perspective of the development of application prospects, with its research becoming more and more extensive, everything is possible. From the perspective of Lingnan characteristic interior decoration, the future materials must be modern, and be able to adapt to the level of scientific and technological development. Therefore, from this perspective, in addition to excellent mechanical properties and thermophysical properties,

nano-ceramic materials also have higher development possibility and bigger development space.

#### **4.3 Excellent Electrical Performance is An Essential Ability in the Future**

It is an important development trend for nano-ceramic materials to have high performance in Lingnan characteristic interior decoration, including electrical properties. These capabilities include using nano powder as raw materials to produce ceramic capacitors and piezoelectric ceramics, so that the application ability and level of nano-ceramic materials can be more reflected in the home space, better consistent with the environment and space. Therefore, from this point of view, it is possible to produce nano composite or nano-modified high-tech ceramics with electrical properties. This includes the requirements for the density of nano-ceramic materials, such as excellent piezoelectric, dielectric, acoustoelectric and other electrical properties. Therefore, from the perspective of development prospects, the wide application space of nano-ceramic materials is huge, especially the future interior decoration design must be inseparable from electronic technology, laser technology, communication, sensing technology, environmental protection technology and sound insulation technology, so nano-ceramic materials have a wide range of application value<sup>[3]</sup>.

#### **5. Conclusion**

From the perspective of nano-ceramic materials in Lingnan characteristic interior decoration design, it is obvious that nano-ceramic technology with high-tech performance is the product of the combination of modern science and technology. It can not only meet the application of nano-ceramic materials in Lingnan characteristic interior decoration, but also produce greater possibility and wide application space for Lingnan characteristic interior decoration upgrading. At that time, it must rely on the level of scientific development, and all the fields of modern basic science and technology need the integration and development of multi disciplines<sup>[4]</sup>. Therefore, from this point of view, the application prospect of nano-ceramic materials in Lingnan characteristic interior decoration is broad, but at the same time, it also needs the integration and combination of traditional Lingnan characteristic interior decoration methods, which is the only way to better meet the needs of the market and achieve better design effect.

#### **Acknowledgements**

Source topics: 2019 Guangdong Provincial Department of Education “Innovative and Strong School Project” scientific research project; Question number: 2018WQNCX315;

Subject name: Inheritance and innovation of Lingnan characteristic interior design under the background of the construction of the Guangdong-Hong Kong-Macao Greater Bay Area

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