

The Application of New Building Materials in Civil Engineering Construction

Shaoqiang Sun^a, Yudong Han^b

School of Civil Engineering, University of Science and Technology Liaoning, Anshan 114051, China

^a1350326867@qq.com, ^b26698257@qq.com

Abstract

With the continuous development and progress of domestic economic level and scientific and technological level, the construction technology level in the construction industry has also been significantly improved. In order to meet the national requirements for energy conservation and environmental protection, the new building materials with good energy conservation and environmental protection performance have been more and more used in construction projects. The application of various new building materials will not only reduce the pollution and damage of the project construction to the surrounding environment, but also further improve the construction quality of the project, and promote the continuous development of the civil engineering industry. Based on this, the paper studies the application of new building materials in civil engineering construction, in order to promote the development of the construction industry, for its reference.

Keywords

Civil Engineering Construction; New Building Materials; Energy Conservation and Environmental Protection; Application Analysis.

1. Introduction

With the rapid development of social economy, the construction industry has attracted wide attention from all walks of life, and the serious problems of environmental pollution and resource consumption in construction have not been well solved. In order to ensure the long-term development of the construction industry, the construction industry must implement the construction concept of energy conservation and environmental protection, because the implementation of energy conservation and environmental protection construction concept can improve the social and economic benefits, but also can play an environmental role in the surrounding environment to a certain extent [1].

At present, people have begun to pay attention to the use of new building materials, new building materials in addition to reduce the cost, but also green environmental protection, the construction process will not cause pollution and damage to the ecological environment, fully meet the modern construction requirements, but also promote the development of the domestic construction industry.

2. Overview of the New Building Materials

2.1 The Advantages of the New Building Materials are Even Greater

Compared with the new building materials, the traditional building materials cause the phenomenon of greater energy consumption in the construction process: Moreover, the traditional building materials pollute the surrounding environment during the construction process. Therefore, at the present stage of the construction of environmental pollution is a major problem that construction

enterprises need to solve. The appearance of new building materials is not only in the performance or energy, have the advantages of traditional building materials do not have. And in the construction process does not damage the surrounding environment. In addition, new building materials can also improve efficiency, while ensuring the quality of shortening the construction period.

2.2 Main Features of the New Building Materials

New building materials mainly have the following two characteristics: on the one hand, the function of new building materials has diversified characteristics, which can meet the requirements of civil engineering construction. In addition, it provides users with a more comfortable and safe living environment, and most of the new building materials also have fire prevention, antibacterial and other characteristics. On the other hand, under the rapid development of science and technology in China, the application of the process and technology of new building materials in the production process is more advanced, and the construction process has become more perfect, which provides a solid foundation for ensuring the construction quality of civil engineering[2].

2.3 Promote the Sustainable Development of the Construction Industry

Construction industry is one of the important pillars of China's economic development, which will bring serious impact on the development of national economy. China takes ecological civilization construction as an important goal, and the construction industry should keep up with the pace of social development and improve today's construction technology and building materials. The waste produced by new building materials also has good environmental performance and will not produce pollution to the environment. And can reduce the use of disposable materials to greatly improve the utilization rate of resources, reduce energy consumption.

3. Development Status of New Building Materials

In the process of continuous economic and social development, people's use and demand for building materials are also constantly changing, and more and more people begin to engage in the research and development of building materials. At present, due to the improvement of people's material level, more and more new building materials emerge in one after another, which promotes the development of the construction industry to a large extent.

Nowadays, the continuous progress of science and technology to the new building materials research is more and more deep, the research and development of new building materials also has a set of relatively complete production and sales work chain. With the industry chain of new building materials becoming more and more complete, the construction technology is becoming more and more advanced, and the new building materials are more environmental friendly, healthy, energy-saving, moving towards the direction of green environmental protection.

4. Characteristics of the New Building Materials

4.1 Functional Diversification

In the process of construction, the traditional building materials are less common, the quality is not good, but less application conditions, can't meet people's requirements for construction. After the research and development of new building materials and put into use, the disadvantages of traditional materials have been effectively solved. New building materials are not only green and environmental protection in the process of construction to reduce the pollution to the surrounding environment, but also fire prevention and bacteria prevention mentioned the safety of the whole building, which is also the residents more secure to live.

4.2 Component Compound

Functionally diversified new building materials in the production of materials is not a single, is composed of a variety of materials ratio mix. In the invention of new building materials, the research and development personnel need to try the proportion and function of various materials, and finally

study a new green, environmental protection and energy-saving multifunctional building materials. Make it better meet the construction requirements.

4.3 More Energy Saving and Environmental Protection

At present, energy conservation and environmental protection has become an inevitable trend of social development, and also an important way to practice sustainable development. Only by complying with the law of social development can enterprises develop better. Therefore, construction enterprises only adapt to the social development, from the building materials for innovation and reform. Traditional building materials are developed mainly considering the living experience of residents, without considering the environmental and energy conservation problems. The design concept of new building materials not only ensures the living experience of residents as far as possible, but also tries to achieve energy conservation and environmental protection.

5. The Application of New Building Materials in Civil Engineering Construction

5.1 The Concrete Application of Green Building Materials in Outdoor Construction

External civil engineering construction of green building materials it can be divided into two parts: one is environmental protection building glass. This glass is mainly used for external walls, has a certain self-cleaning ability, hydrophobicity can make the rain slide away the dust on the glass, reduce the dirt on the glass is what we call self-cleaning glass; the appearance of colored glass provides a better indoor environment, when the indoor temperature is too high, colored glass will automatically drop the internal light transmittance is low, to provide a comfortable living temperature for people. Secondly, the new concrete. This concrete is different from traditional concrete, on which adds fiber and minerals so it can be built in a rough construction environment. The new type of concrete can be divided into fiber concrete and light concrete, intelligent concrete and color concrete. These four concrete have different characteristics, fiber concrete has better pressure resistance is recognized; intelligent concrete can adjust the environment, purify the air characteristics; color concrete can feel the air humidity, when the air humidity changes automatically change color, conducive to predict climate change, adjust construction ideas; light mixture concrete has simple operation, good cold resistance characteristics.

5.2 Application of Thermal Insulation Materials

The emergence of new insulation material plays a very beneficial role in the insulation effect of civil engineering, and reduces the power consumption of air conditioning. For example, nano aerogel insulation materials not only have the characteristics of gas-solid conversion, but also have easier construction and installation. However, this material nano aerogels are expensive, and, therefore, are not widely used in the initial stage. As people more and more care for the environment, and began to pay attention to nano-gas gel material, and in-depth research and analysis, so that nano-aerogel material can be used in most construction projects, aerogel energy-saving window and roof solar set water heater is widely used. Because the solid aerosol gel material has a strong thermal insulation function, mainly is used in the building window thermal insulation system, to achieve the purpose of heat insulation, noise reduction, sound absorption. At the same time, the aerogel energy-saving window can control the indoor temperature change more reasonably. Compared with ordinary glass, not only can better adjust the ultraviolet refractive index, under the protection of double glass, can also adjust the outdoor air pressure, to ensure that the room can be completely sound insulation, constant temperature and humidity. At present, in the construction process in China, due to the use of a new thermal insulation material, the thermal insulation material has diverse functions, and the green environmental protection performance meets the requirements of China, so it is widely used.

5.3 Application of Thermal Insulation Materials

When China pays more and more attention to environmental protection, the concept of green environmental protection has been fully implemented in the process of civil engineering construction,

and the main building materials choose new building materials. Compared with traditional building materials, new building materials have many advantages. In the process of choosing building materials, the actual situation of civil engineering should be reasonably selected according to the situation. In fully understanding of the indicators and advantages, combined with the requirements of green building materials in civil engineering, choose green building materials as the main building materials. For example, when the application of new building materials in high-rise buildings, the new building materials should be selected according to the Angle of the building. If the choice of materials cannot give full play to the advantages of materials, and it is not consistent with the concept of green environmental protection advocated by China. Due to the complex structure of the top of the building and the top position of the building, in the design process, it is necessary to choose a landmark building to reflect the characteristics of the building. This traditional building material cannot achieve the effect, so it must be fully integrated into the new building materials. In addition, under the continuous development of China's social economy, China's construction industry is also constantly developing continuously. With a more complete, more scientific basis for the application of advanced construction technology and materials, construction enterprises also have to train technical personnel, in order to play the role of advanced construction technology and new building materials, and constantly promote the development of China's construction industry.

5.4 Application in Building Structure

The development of science and technology in China has promoted the development of new building materials, especially to further improve the material performance. In the process of construction, light steel must be used. Compared with traditional materials, light steel is more suitable for civil engineering buildings, compared with traditional materials not only have stronger stability, can also produce sound insulation effect under the premise of ensuring beauty. In the actual construction process, the more and more widely used in civil engineering not only guarantees the construction quality, but also saves a lot of construction costs. The appearance of gypsum mortar material replaces the consumption of ordinary cement mortar, and also has a certain role in environmental protection, and further reduces the cost of construction. Moreover, in the process of concrete cutting blocks, fly ash and slag ash will be applied, these materials will be used, not only to save resources, but also can play a role in protecting the environment [3].

6. The Future Development of New Building Materials in Civil Engineering

Nowadays, China is facing not only environmental problems, energy shortage is also one of the important problems that China needs to face, in the stable energy supply of energy has been severely challenged for a long time. China has a large territorial area and a large population. In previous years, the area of new housing ranked first in the world, and it has even exceeded the total annual construction area of developed countries. The rapid development of the construction industry has brought a huge impact, not only the huge energy consumption, but also the environment. If the high consumption of energy pollution and environmental construction is left alone, it will seriously affect the country's energy, environment, economic development. Therefore, in order to realize the sustainable energy development, it is an inevitable trend to fully carry out new building materials.

7. Conclusion

Under the popularization of the concept of green environmental protection, the construction industry is also developing constantly. The emergence of new building materials and the application in construction engineering are not only environmental protection, but also conducive to saving construction costs, so the construction industry has been widely concerned. However, in the application process of the new building materials, we should proceed from the actual situation to ensure the performance and feasibility of the new building materials, optimize the building structure, and achieve the green and environmental protection performance. In addition, the relevant researchers

should also speed up the pace of research, and increase the research and development of new building materials.

References

- [1] Ligui. Zhang Application Strategy of New Building Materials in Civil Engineering Construction [J]. Real Estate World, 2021 (23): 132-134.
- [2] Xiangyu. Ma A Brief Analysis of the Application of New Building Materials in Civil Engineering Construction [J]. Bulk cement, 2022 (02): 10-12.
- [3] Jianpeng. Qiao The Application of New Building Materials in Civil Engineering [J]. Paper equipment and materials, 2021,50 (02): 67-69.
- [4] Wai Wong. The Application of New Building Materials in the Structural Design of Building Engineering [J]. Ceramics, and the 2022(108.DOI:10.19397/j.cnki.ceramics. 2022.04.036.